

Draft Alternative Urban Areawide Review and Mitigation Plan

Marion Road Trunk Sanitary Sewer Project

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City of Rochester

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ALTERNATIVE URBAN AREAWIDE REVIEW (AUAR) APPLICABILITY OVERVIEW

1. IF YOU LIVE IN THE PROJECT AREA AND HAVE A SEPTIC SYSTEM AND/OR WELL

For subdivisions that are not under an orderly annexation agreement with the City of Rochester, the City does not require existing home or business owners to connect to City sewer and/or water when it is installed to serve a particular subdivision, as long as their private well or septic system is in good operating condition. If your private well and septic system are currently in good operating condition, you do not need to connect to public water or sewer. In subdivisions with available City services, connection is required when the respective private systems fail. If your subdivision is not covered by an orderly annexation agreement and sanitary sewer and water service are desired, the following steps must occur to connect:

- Subdivision residents petition the City for sewer and water service.
- A study is conducted to determine if it is economically and physically feasible for sewer and water extensions to be constructed.
- The City Council holds a public hearing about the feasibility report and the citizen petition.
- If the construction is feasible and the City Council approves the petition, the City and Township must enter into an annexation agreement.
- Before connections to individual homes can be made, connection agreements must be executed between the homeowner or business and the City.

Natural and cultural inventory information in this document may help you determine if there are resources on your land that could be considered for preservation or stewardship. If you are interested in pursuing preservation or stewardship options, please contact the Rochester-Olmsted Planning Department (ROPD) at (507) 285-8232.

2. IF YOU INTEND TO BUILD HOMES OR OTHER DEVELOPMENTS IN THE PROJECT AREA

Any proposed development would need to be reviewed for consistency with the AUAR and Mitigation Plan. If a development plan is not consistent with these documents or if there are other statutory requirements, the developer may need to conduct additional environmental documentation or review. In addition to this review, a determination would be made as to whether or not it is economically and physically feasible to construct sewer and water extensions to serve the proposed new development. Natural and cultural inventory information in the AUAR and the Mitigation Plan will be used to guide development. Design and construction would proceed only after all petitions, approvals, appropriate agreements, and annexation procedures are complete.

If your property is located within the Rochester Urban Service Area (USA), or even in some cases the Urban Reserve Area (URA), interim development may be allowed utilizing private wells and/or septic systems. In the case of interim development, residential development will be permitted through the creation of a special district as outlined in Section 62.90 of the *City of Rochester Code of Ordinances* and the submission of a General Development Plan (GDP) that illustrates how future development would be integrated with the interim development. This process will ensure a design pattern that would be consistent with a future (more dense) development pattern served by municipal sewer and water. The interim development process also requires the establishment of agreements for annexation and for future sewer and water hook-ups. An escrow account is required to pay for future costs associated with infrastructure development. Interim development will be limited to the established sewer districts within an USA serviceable by the City between 10 and 25 years from the date of approval. A schedule for sewer and water systems extensions must exist for the affected subwatershed service areas.

3. IF YOUR DEVELOPMENT PROJECT IS INCONSISTENT WITH THE HYPOTHETIC DEVELOPMENT SCENARIO

The AUAR forecasts a reasonable and feasible hypothetical development scenario based on approved land uses. Actual development densities and patterns will need to be monitored and compared to the development scenario. As a mitigation strategy, the City will track development in the project area. If your proposed development is not consistent with the hypothetical development scenario, you may be required to assist in updating this AUAR and/or undertake a separate environmental review process, such as an Environmental Assessment Worksheet (EAW).

4. IF YOU OWN PROPERTY IN THE PROJECT AREA, BUT DO NOT PLAN TO DEVELOP IT

Until such time as you plan to modify or develop property in the project area, the AUAR and Mitigation Plan do not directly affect your property. However, natural and cultural inventory information in this document may help you determine if there are resources on your land that could be considered for preservation or stewardship. If you are interested in pursuing preservation or stewardship options, please contact the ROPD at (507) 285-8232. If you decide to modify or develop your property Item 2 above applies and early coordination with the City is highly recommended.

EXECUTIVE SUMMARY

1.0 INTRODUCTION

In December 1998, the City of Rochester initiated a Water Quality Protection Program (WQPP) to extend sanitary sewer and water to homes with failing and substandard septic systems and wells primarily in areas surrounding the City with near-surface groundwater. Hundreds of homeowners near Rochester's southeastern boundary petitioned for this service. The Marion Road Trunk Sanitary Sewer Project was developed in response to the City Council's acceptance of petitions for service to homes and businesses in Sewer Service Area 16. The completion of this Alternative Urban Areawide Review (AUAR) became a special condition of the "Revised Permit for the Construction and Operation of a Disposal System" for the Marion Road Trunk Sanitary Sewer Project (No. 23305, April 21, 2000).

The extension of sanitary sewer and water lines to older neighborhoods outside the City limits was the culmination of a lengthy process. A correlation between older subdivisions with failing and substandard septic systems and contaminated groundwater in these areas led to the establishment of the WQPP. The objective of the project was to improve and protect groundwater quality in the Rochester area by providing City water and sanitary sewer facilities for the collection and treatment of wastewater to older subdivisions that were built with small lots without the capacity for septic system replacement. The City obtained state approval to collect limited sales tax money to help pay for the construction of the sewer and water lines and to subsidize the individual homeowner and business connections and abandonment of private wells and septic systems. The City Council adopted a policy in 1992 whereby the City does not require any existing home or business owner to connect to City sewer and/or water when it is installed to serve a particular subdivision, as long as their private well or septic system is in good operating condition. In subdivisions with available City sewer and/or water services, connection is required when the respective private systems fail. Consequently, connection to City services was voluntary. However, subdivisions desiring these services were also subject to annexation into the City.

2.0 THE AUAR PROCESS

An AUAR is a type of environmental review used to assess potential cumulative environmental impacts of future urban development over a broad geographic area. The AUAR process is limited to the analysis of impacts from residential, light industrial, and warehousing development that would otherwise encompass several projects independently under the traditional Environmental Assessment Worksheet (EAW) process. This AUAR also includes some neighborhood commercial development within residential areas. The EAW process typically applies to smaller-scale, project-specific assessments and does not address development projects less than eighty acres in size unless other thresholds requiring environmental review are met or exceeded. In addition to the completion of an inventory of natural and cultural resources and the evaluation of the impact on those resources from future development, the

AUAR process also includes the preparation of a “Mitigation Plan” that identifies methods to avoid, minimize, or mitigate unacceptable environmental impacts that may have independent or cumulative effects as future development takes place. This AUAR document consists of three parts:

- Part I – Marion Road Trunk Sanitary Sewer Project Alternative Urban Areawide Review Background and Process.
- Part II – Marion Road Trunk Sanitary Sewer Project Alternative Urban Areawide Review Response to Questions.
- Part III – Marion Road Trunk Sanitary Sewer Project Alternative Urban Areawide Review Mitigation Plan.

3.0 INPUT TO DEVELOPMENT SCENARIO

As part of establishing the development scenario, land use patterns were considered that accounted for existing development, developable residential lands, and areas that are considered “highly constrained”, and, therefore, undevelopable. Highly constrained areas consist of floodways, water bodies, and other physical features that are either barriers to construction or features rigorously regulated by law. Moderate constraints that can be mitigated (through avoidance, minimization, or compensatory mitigation of impacts) or low constraints that are unregulated did not affect the overall density applied to the hypothetical development scenario because it cannot be assumed that they will prohibit development. The location of varying levels of residential density within the project area reflected existing and planned infrastructure capacity, existing development patterns, approved land uses and zoning districts, along with the locations of cultural and natural resource features.

4.0 DEVELOPMENT SCENARIO

It is important to remember that *the hypothetical development scenario reflects the highest reasonable and feasible density that could be expected to occur in the project area* given the designated land use patterns and the logical zoning district that would apply to the area upon its annexation into the City of Rochester. This is done to help maintain consistency between future developments within the project area such that unanticipated environmental impacts and less rigorous, independent environmental reviews are avoided. In most cases, independent environmental reviews can be avoided if future development proposals are consistent with the AUAR and Mitigation Plan.

The hypothetical development scenario was adopted by the City Council on January 23, 2002. The scenario does not preclude or supercede the City and County official plans, ordinances, and development process, or change opportunities for interested citizens to participate in the development process.

5.0 MITIGATION PLAN

To mitigate unacceptable environmental impacts identified in the Marion Road Trunk Sanitary Sewer Project AUAR, the following mitigation measures have been identified. As existing ordinances, plans, and regulations are amended, modified, or replaced, they will be applicable to the AUAR project area. The changes may trigger an AUAR update only if mitigation measures need to be modified as a result of these changes. Plans and policies provide guidance and context for future development that is

implemented via ordinances and resolutions adopted by the City Council. In some cases, other jurisdictional units are responsible for implementation of mitigation measures. In such cases, the City will take reasonable and good faith efforts to secure such actions from its governmental counterparts that have the authority and responsibility for implementing noted mitigation measures.

- All permits identified in the AUAR will be secured by the City, or other public or private parties as appropriate, for all development activities within the project area.
- The City will follow the guidance and context in its adopted policies and plans and oversee the implementation of its own regulations as they apply to the review and approval of all development activities within the project area. These items include the *Land Use Plan for the Rochester Urban Service Area* and the *City of Rochester Code of Ordinances*. The City's *Stormwater Management Plan* and *Comprehensive Wetland Management Plan* will be used as technical resources in reviewing development activities. County planning documents will be followed as appropriate for interim development, including the *Olmsted County General Land Use Plan*, the *Olmsted County Zoning Ordinances*, and the *Olmsted County Comprehensive Water Management Plan*.
- The City's extension of sewer and water services will progress consistent with development needs, WQPP guidelines, and this AUAR. Well and septic system construction and abandonment regulations will be followed in the project area.
- The appropriate roadway authority will monitor traffic changes associated with new development within the AUAR project area and will implement improvements identified in this AUAR as dictated by traffic levels.
- The City will require the design and construction of adequate regional and local stormwater ponds and trunk facilities to protect water resources and water quality as required by the *City of Rochester Code of Ordinances*.
- The City will implement a tracking mechanism to monitor development and its conformance with the development scenario.
- Transitional lot size densities consistent with Section 63.111 of the *City of Rochester Code of Ordinances* will be followed for development adjacent to large lot subdivisions.
- The City will implement existing floodplain, wetland, shoreland zoning, and related natural resource regulations per the *City of Rochester Code of Ordinances*. Consideration will also be given to natural communities and Decorah-Edge protection measures during the General Development Plan (GDP) review process. County planning documents will be followed as appropriate for interim development, including the *Olmsted County General Land Use Plan*, *Olmsted County Zoning Ordinance*, and the *Olmsted County Comprehensive Water Management Plan*.

- The City will implement the following stewardship mitigation measures:
 1. Educate:
 - a. Decision-makers, the development community, local government staff, and citizens on the benefits of and programs available for natural areas conservation and land stewardship.
 - b. Existing landowners prior to the conception of development plans for their land to inform them about alternative development styles and tools available to conserve the natural resources present on their property.
 2. Prepare an Environmental Review Checklist for use by developers to confirm their understanding of the AUAR data, identify the Mitigation Plan measures applicable to their development proposals, and document their developments' consistency with the hypothetical development scenario. In lieu of completing an EAW worksheet, the Checklist will outline natural resource features, mitigation measures, and land stewardship options as part of the General Development Plan review process as a means to encourage developers to fit the subdivision to the land rather than make the land fit the subdivision.
 3. Provide the development community, consulting firms, governmental units, and referral agencies with examples of conservation design subdivisions and other stewardship tools along with electronic data (e.g., CDs or ArcIMS access on the Internet) that delineates sensitive areas and links AUAR data and mitigation requirements with parcel base maps for use in project design and review.
 4. Update the City of Rochester's *Parkland Acquisition Plan* within the next five years to identify future park needs in the AUAR project area including the identification of floodplains and other natural areas appropriate for public land acquisition in consideration of passive use and environmental corridor development.
 5. Update the *Rochester Urban Service Area Land Use Plan Map* to delineate cultural (archaeological, historic, and architectural) sites and environmental corridors located in the recently expanded areas of the City's Urban Service and Urban Reserve Areas by the end of 2004.

Refer to Part III-Mitigation Plan, Table 3-1 for a tabular listing of specific mitigation measures and responsible entities.

PART I - MARION ROAD TRUNK SANITARY SEWER PROJECT ALTERNATIVE URBAN AREAWIDE REVIEW BACKGROUND AND PROCESS

1.0 BACKGROUND

In December 1998, the City of Rochester initiated a Water Quality Protection Program (WQPP) primarily to extend sanitary sewer and water to homes with failing and substandard septic systems and wells in areas surrounding the City with near-surface groundwater. Hundreds of homeowners near Rochester's southeastern boundary petitioned for this service. The Marion Road Trunk Sanitary Sewer Project was developed in response to the City Council's acceptance of petitions for service to homes and businesses in Sewer Service Area 16. The completion of this Alternative Urban Areawide Review (AUAR) became a special condition of the "Revised Permit for the Construction and Operation of a Disposal System" for the Marion Road Trunk Sanitary Sewer Project (No. 23305, April 21, 2000).

The extension of sanitary sewer and water lines to older neighborhoods outside the City limits was the culmination of a lengthy process. A correlation between older subdivisions with failing and substandard septic systems and contaminated groundwater in these areas led to the establishment of the WQPP. The objective of the project was to improve and protect groundwater quality in the Rochester area by providing City water and sanitary sewer facilities for the collection and treatment of wastewater to older subdivisions that were built with small lots without the capacity for septic system replacement. The City obtained state approval to collect limited sales tax money to help pay for the construction of the sewer and water lines and to subsidize the individual homeowner and business connections and abandonment of private wells and septic systems. The City Council adopted a policy in 1992 whereby the City does not require an existing home or business owner to connect to City sewer and/or water when it is installed to serve a particular subdivision, as long as their private well or septic system is in good operating condition. In subdivisions with available City sewer and/or water services, connection is required when the respective private systems fail. Consequently, connection to City services was voluntary. However, subdivisions desiring these services were also subject to annexation into the City. The process outlined below was followed before homes on private wells and septic systems could become part of the WQPP:

1. Residents of a subdivision interested in receiving City sewer and water services petitioned the City for these services.
2. A study was then conducted to determine if it would be economically and physically feasible for the sewer and water extension to be constructed.
3. Public hearings were held by the City Council on the feasibility report and the citizen petitions.
4. Once the construction was deemed feasible and the Council approved the petition, the representatives of the City and Marion Township negotiated an orderly annexation agreement. Under the orderly annexation agreement, the City agreed to defer annexation until no sooner than January 1st of the year five years after a sanitary sewer and water main project was substantially completed to serve each subdivision.
5. When construction made sanitary sewer and water service available to subdivisions in the orderly annexation areas, connection agreements were executed between the individual homeowners and the City for those property owners with failing systems.

6. Once connection agreements were executed, service connections were made to individual homes.

As part of a Minnesota Pollution Control Agency (MPCA) and City agreement, outlined in an April 18, 2000, letter from the MPCA, limitations were set on the number of individual sewer and water connections that could be made to the Marion Road Trunk Sanitary Sewer Project prior to the completion of an AUAR for the project area. The area that could be served by the Marion Road Trunk Sanitary Sewer Project was divided approximately in half, with Phase I in the mostly developed western half and Phase II in the eastern half. Under these requirements, only 659 connections to the project sewer could be made in the Phase I area and no connections to the project sewer could be made in the Phase II area until the AUAR was completed. As part of the AUAR process, the project area was refined based on a more complete assessment of constraints, existing and expected development patterns, and the hypothetical development scenario adopted by the City Council as part of the Order for Review, in addition to pipe capacity calculations. The Phase 1 and 2 areas associated with the original project area were delineated to negotiate allowable sewer connections prior to completion of the AUAR. This terminology is not applicable for the AUAR process, which looks at a “project area.” The AUAR project area includes approximately 4,316 acres located southeast of the City of Rochester in Marion Township adjacent to the City’s Corporate Limits (Figures 1-1 and 1-2). About 2,300 acres of the AUAR project area falls within the former Phase II area. Figure 1-3 shows existing and proposed trunk sanitary sewer extensions in the project area.

2.0 ALTERNATIVE URBAN AREAWIDE REVIEW BACKGROUND

2.1 Alternative Urban Areawide Review Purpose

An AUAR is a type of environmental review used to assess the potential cumulative environmental impacts of future urban development over a broad geographic area. The AUAR process is limited to the analysis of impacts from residential, light industrial, and warehousing development that would otherwise encompass several projects independently under the traditional Environmental Assessment Worksheet (EAW) process. This AUAR also includes some neighborhood commercial development within residential areas. The EAW process typically applies to smaller-scale, project-specific assessments and does not address development projects less than eighty acres in size unless other thresholds requiring environmental review are met or exceeded. In addition to the completion of an inventory of natural and cultural resources and the evaluation of the impact on those resources from future development, the AUAR process also includes the preparation of a “Mitigation Plan” that identifies methods to avoid, minimize, or mitigate unacceptable environmental impacts that may have independent or cumulative effects as future development takes place. This AUAR document consists of three parts:

- Part I – Marion Road Trunk Sanitary Sewer Project Alternative Urban Areawide Review Background and Process.
- Part II – Marion Road Trunk Sanitary Sewer Project Alternative Urban Areawide Review Response to Questions.
- Part III – Marion Road Trunk Sanitary Sewer Project Alternative Urban Areawide Review Draft Mitigation Plan.

2.2 Steps in the Alternative Urban Areawide Review Process

The major steps in completing an AUAR are summarized below:

1. The Minnesota Environmental Quality Board (EQB) assigns responsibility for environmental review projects to a specific unit of government identified as the Responsible Governmental Unit or RGU. This is usually the unit of government with the greatest authority over the project as a whole. In this case, the City of Rochester, as the permit holder with the AUAR requirement, has been identified as the RGU. The first step in the AUAR process occurs when the RGU adopts an Order for Review that describes the boundaries of the area to be reviewed and the “development scenario” allowed under the adopted land use plans in effect for the area. The Marion Road Trunk Sanitary Sewer Project AUAR Order for Review was adopted on January 23, 2002 (Appendix A).
2. A draft AUAR document is prepared that outlines the potential environmental impacts related to fish, wildlife and ecologically sensitive resources, surface and groundwater resources, geologic resources, and air quality, among others.
3. A draft Mitigation Plan is prepared describing ways to avoid, minimize, and/or mitigate potential environmental impacts.
4. The draft AUAR and Mitigation Plan undergo a 30-day public notice period during which comments are received. The draft document is then revised to address the comments received.
5. The finalized AUAR and Mitigation Plan are distributed for review.
6. If no objections are filed by any state agency within 10 days, the documents are adopted by the RGU. If objections are filed by a state agency, resolution is attempted and/or the EQB makes a determination of adequacy.
7. Once adopted, the RGU works with cooperating agencies (as identified in the Mitigation Plan) to ensure that future development conforms to the AUAR and Mitigation Plan to avoid, minimize, or mitigate unacceptable impacts. Residential (with neighborhood commercial nodes), light industrial, and warehousing development projects that are in full conformance with the AUAR and Mitigation Plan should not require their own environmental reviews (such as EAWs), unless specifically mandated by EQB rules. If they are not in conformance with the AUAR, a separate environmental review may be required, or in some cases, the AUAR revised.
8. At a minimum, the AUAR must be updated by the RGU every five years.

2.3 Public Involvement

This AUAR was prepared using three primary mechanisms that provided opportunities for interested stakeholders to obtain information and provide input during this process. Interested parties included residents; landowners and developers; Township, City, and County elected and appointed officials; and local and state agency staff. These mechanisms were:

- Establishing a project web site.
- Creating a Technical Advisory Committee (TAC).
- Holding public open houses.

2.3.1 Project Web Site

The City's web site, located at <http://www.ci.rochester.mn.us/publicworks/auar.htm>, was used to post project information, meeting notices, meeting notes, and contact information for persons with internet access who were interested in keeping apprised of project information and status.

2.3.2 Technical Advisory Committee

The TAC was created by the Rochester City Council so that representatives of City, Township, County and interested agencies could provide formal input throughout the process. TAC members represented Marion Township residents, Marion Township Board, Rochester City Council, Rochester Public Works Department, Rochester Committee on Urban Design and Environment, Rochester-Olmsted Planning Department (ROPD), Olmsted County Board, Olmsted County Environmental Commission, Olmsted Soil and Water Conservation District, Olmsted Wetland Conservation Act Local Governmental Unit representative, Department of Natural Resources, and MPCA. (See Table 1-1 for a list of TAC members.) Four meetings were held to obtain TAC input as described below.

On August 29, 2001, a field review was held to:

- Introduce TAC members and other agency staff to the project.
- Familiarize participants with the project area (including a bus tour with several representative stops).
- Initiate the TAC input process.
- Identify regulatory issues, environmental constraints, and other pertinent information.
- Identify key agency contacts.

On September 25, 2001, a meeting was held to:

- Discuss inventory results and the regulatory status of identified features.
- Discuss feasible locations for development, given physical and regulatory constraints.
- Obtain input on a draft hypothetical development scenario before conducting the impact analysis.
- Review the project boundaries based on the development scenario.

On January 3, 2002, a meeting was held to:

- Review the existing policy framework for environmental stewardship (based on a draft stewardship document prepared by the ROPD).
- Identify examples of stewardship tools that could be voluntarily applied locally.
- Identify potential means by which stewardship could be promoted in the absence of regulatory controls.

On February 26, 2002, a meeting was held to:

- Review and obtain input on the preliminary draft AUAR and Mitigation Plan prior to public notice and distribution.

TABLE 1-1

**TECHNICAL ADVISORY COMMITTEE MEMBERS
Marion Road Trunk Sanitary Sewer Project AUAR**

Organization	Representative
Marion Township Board	Jim Baier
Marion Township Resident	Tim Swanson
Marion Township Resident	Ed Scherr
Marion Township Resident	Jim Mosser
MN Pollution Control Agency	Joellen Rumley
MN Department of Natural Resources	Don Nelson
Rochester City Council	Dave Senjem
Rochester Public Works Department	Richard Freese
Rochester Committee on Urban Design & Environment	Christine Schultze
Rochester-Olmsted Planning Department	Charlie Reiter
Olmsted County Board	Jeff Thompson
Olmsted County Environmental Commission	Chuck Michael
Olmsted Soil and Water Conservation District	Skip Langer
Olmsted Wetland Conservation Act Representative	John Harford

2.3.3 Public Open Houses

Two public open houses were held as a means to disseminate information and receive input. The first was held on November 1, 2001, to:

- Provide an overview of the AUAR process.
- Share the results of the natural and cultural resource inventories.
- Describe how these features might limit or restrict future development.
- Describe the proposed development scenario and project area boundary before submittal to the City Council for adoption.
- Obtain public input on work completed to date.

A second public open house was held on April 11, 2002 prior to the draft AUAR and Mitigation Plan comment period. The intent of this session was to review the contents of the draft AUAR and Mitigation Plan and answer questions to help facilitate the formal 30-day public comment process.

3.0 ESTABLISHING THE DEVELOPMENT SCENARIO

A critical component of the AUAR process is the preparation of a development scenario that will be used to determine and evaluate the potential maximum cumulative environmental impacts on the project area caused by future development. A hypothetical development scenario describes the anticipated types and density of residential and non-residential development throughout the project area. It quantifies potential future development in terms of the number of housing units and the amount of non-residential square footage. The *City of Rochester Urban Service Area Land Use Plan (City Plan)* guides the land uses and density levels projected in the hypothetical development scenario. Land uses consistent with this planning document and the development scenario are described in Part II - Marion Road Trunk Sanitary Sewer Project AUAR Response to Questions as part of the response to Questions 6 and 9.

The hypothetical development scenario was adopted by the City Council on January 23, 2002. *The hypothetical development scenario reflects the highest reasonable and feasible density that could be expected to occur in the project area.* This is done to help maintain consistency between future developments within the project area such that unanticipated environmental impacts and less rigorous, independent environmental reviews are avoided. The development scenario does not preclude or supercede the City and County official plans, ordinances, and development process, or change the opportunities for interested citizens to participate in the development process.

Originally, the project area boundary for the Marion Trunk Sanitary Sewer Project AUAR discussed with the MPCA was developed using an estimation of sewer capacity from the trunk sewer line extension based on average development densities across a broad geographic area. As part of the AUAR process, the project area was refined based on a more complete assessment of constraints, existing and expected development patterns, and the hypothetical development scenario adopted by the City Council as part of the Order for Review, in addition to pipe capacity calculations. The Phase 1 and 2 areas associated with

the original project area were delineated to negotiate allowable sewer connections prior to completion of the AUAR. This terminology is not applicable for the AUAR process, which looks at a “project area.”

After evaluating these factors, the project boundary presented in Figure 1-2 and evaluated in this AUAR was developed. The revised project area boundary also acknowledges that the majority of the Suburban Development Area (SDA) is not likely to ever be served by sanitary sewer because construction was completed in accordance with regulations to reserve lot space for septic system repair or replacement, and because the low development densities render service economically impractical. County Road 11 was selected as the boundary through the SDA. Several small-lot subdivisions that are adjacent to County Road 11 may have a need for future sewer connection should their septic systems fail. Sewer capacity calculations used to establish the revised project boundary took into account the contributions from small-lot subdivisions even though they may never opt to connect. The remaining undeveloped portion of the Urban Reserve Area (URA) was also added to the project area.

4.0 NATURAL AND CULTURAL RESOURCE INVENTORY RESULTS

A natural and cultural resource inventory of the project area was completed as part of the process to establish a development scenario. The purpose of the inventory was to identify and map environmental and cultural (archaeological, historic, and architectural) resources in the project area that could be impacted by future development. A Geographic Information System (GIS) was used to develop computerized maps that display multiple layers of natural and cultural resource inventory information on a base map. The City used these maps to evaluate the resource inventories and development patterns in the project area to help identify areas that might be impacted by development, as well as those that could limit or restrict development. The results of the inventory were used to prepare constraint mapping used in the preparation of the development scenario.

4.1 Natural Resources

The U.S Fish and Wildlife Service (USFWS) records identify the bald eagle (*Haliaeetus leucocephalus*), Leedy’s roseroot (*Sedum integrifolium* spp. *Leedyi*), and prairie bush clover (*Lespedeza leptostachya*) as federally threatened in Minnesota and documented to occur in Olmsted County. However, the USFWS determined that there are no records indicating that these species occur within the project area. Given the location and type of activity proposed, the USFWS determined that the project is not likely to adversely affect any federally listed or proposed federally threatened or endangered species or adversely modify their critical habitat

The features inventoried are listed below with their respective data sources shown in parentheses. The following features are mapped in Figure 1-4.

- **State endangered plants and animals** are threatened with extinction throughout all or a significant portion of their ranges in Minnesota. (Minnesota Department of Natural Resources, MnDNR). None occur in the project area.
- **State threatened plants and animals** are likely to become endangered within the foreseeable future throughout all or a significant portion of their ranges in Minnesota. (MnDNR).

- **State special concern species** are extremely uncommon in Minnesota, or have unique or highly specific habitat requirements, and deserve careful monitoring. (MnDNR).
- **Sites of biological significance** are areas with varying levels of native biodiversity (outstanding, high, or moderate) that may contain high quality native plants that were evaluated on the basis of the number of rare species, the quality of the native plant communities, size of site, and context within the landscape. Disturbed areas within Minnesota County Biological Survey (MCBS) sites are retained as negative information and are given the biodiversity significance rank of “below”. These disturbed areas are lands where the natural communities have been seriously altered or destroyed by human activities such as farming, recent logging, draining, and development. (MCBS and MnDNR). No outstanding, high, moderate, or low biodiversity areas occur within the project area. Below minimum biodiversity threshold areas do occur within the area. Areas within MCBS Sites that are found to be disturbed are retained in the layer as negative information and are given the Biodiversity Significance rank of ‘BELOW’. These disturbed areas are lands where the natural communities have been seriously altered or destroyed by human activities such as farming, recent logging, draining, and development.
- **Natural communities** are functional units of the landscape that are characterized and defined by their most prominent habitat features: a combination of vegetation, hydrology, landform, soil, and natural disturbance cycles. Although the natural communities listed below have no legal protection in Minnesota, the Natural Heritage and Nongame Research Program (NHP) and the MCBS identified community types and ranked biodiversity according to their relative rarity and endangerment throughout their range. [(MCBS, Olmsted County, Committee on Urban Design and Environment (CUDE), and MnDNR)]. The Minnesota Land Cover Classification (MLCC) is pending and will be made available to interested parties when completed. The following community types occur in the project area:
 - Planted coniferous forest.
 - Oak forest.
 - Lowland hardwood forest.
 - Other deciduous forest.
 - Oak savanna or woodland.
 - Known or likely prairie remnants.
 - Grassland, old pasture with possible prairie remnants.
 - Shrubland with possible prairie remnants.

The following features are mapped in Figure 1-5.

- **National Wetlands Inventory (NWI)** mapping provides information on the characteristics, extent, and status of the Nation’s wetlands and deepwater habitats. The U.S. Fish and Wildlife Service (USFWS) identified the NWI wetlands on aerial photographs based on vegetation,

visible hydrology, and geography. The photographs typically reflect conditions during the specific year and season when they were taken. Since NWI mapping relies heavily on aerial photograph interpretation, site-specific wetland identification, verification, and delineation are required. As a result, wetlands are delineated on a site-specific basis as part of the General Development Plan process. (ROPD).

- **Wetland indicator soils** are one component of three wetland identification criteria used by the County as indicators of wetlands. The soil categories evaluated are “hydric” and “hydric and floodplain” soils. These are soils that formed under conditions of saturation, flooding, or ponding. This includes soils developed under sufficiently wet conditions to support the growth and regeneration of hydrophytic (wetland) vegetation. [(Natural Resource Conservation Service (NRCS) and ROPD)].
- **Watershed boundaries** identify the area contained in a drainage divide within which precipitation and surface water runoff drain into a common water body. (ROPD).
- **Floodway** is the minimum channel of a watercourse and those portions of the floodplain adjoining the channel that are reasonably required to carry or store the regional flood discharge. [(Federal Emergency Management Agency, (FEMA) and ROPD)].
- **100-year floodplain** is land adjacent to a body of water that may be covered by flood water characteristic of what can be expected to occur with an average frequency in the magnitude of a one hundred year recurrence interval, including that land covered by the regional flood. (FEMA and ROPD).
- **500-year floodplain** is land adjacent to a body of water, which may be covered by flood water characteristic of what can be expected to occur with an average frequency in the magnitude of a five hundred year recurrence interval. (FEMA and ROPD).
- **Flood prone areas** as indicated by the “floodplain” soils category, as mapped by the NRCS, are considered by the County to identify the Floodplain Zoning District in areas not covered by FEMA floodplain maps. (FEMA and ROPD).

The following features are mapped in Figure 1-6.

- **Seeps** are places where water naturally trickles out of the ground, generally on a temporary or seasonal basis. (AUAR TAC).
- **Springs** are areas where there is a natural flow of water, out of the ground either onto the land surface or into a surface water body that are generally continual in nature. (ROPD).
- **Sinkholes** are funnel-shaped depressions in the land surface, generally in a limestone region, that often connect with an underground passage developed by the solution of bedrock. (ROPD).
- **Aggregate (sand and gravel) resources** are locations that have been identified as a potential source of a mineral material, such as sand or gravel that could be mined for road or other construction projects. [(Minnesota Geological Survey (MGS) and ROPD)].

- **Slopes** are the inclined surfaces of a hill or bluff that were mapped based on the following soil survey mapping classifications: 0 to 17 percent, 18 to 25 percent, 26 to 49 percent, and greater than 50 percent. Additionally, slopes greater than 18 percent located in Shoreland Zoning Districts were also evaluated. (NRCS and ROPD).
- **Depth to bedrock and first bedrock unit encountered** underlying an area were also inventoried, but only the first bedrock unit was mapped. (MGS and ROPD).

4.2 Cultural Resources

The 106 Group, Ltd., a consulting firm that specializes in cultural resource evaluations, conducted a preliminary cultural resources review of the project area as part of this inventory. This review included a preliminary cultural resource evaluation for archaeological, historical, and architectural resources for the AUAR project area. This work included a records search to identify recorded cultural resource sites already known to exist and a “windshield survey” of the project area to identify areas with the potential for intact cultural resources. Archaeologists identified areas with a high or moderate potential for archaeological resources based on their topographic location, proximity to water resources, and relative lack of site disturbance. Three types of archaeological resource areas were mapped: one recorded archaeological site, an area of moderate archaeological potential, and two areas of high archaeological potential (Figure 1-7). Areas of potential historical and architectural significance were also identified. More information on cultural resources is provided in Part II - Marion Road Trunk Sanitary Sewer Project AUAR Response to Questions as part of the response to Question 25.

4.3 Constraint Mapping

Constraint mapping is the inventory and ranking of features that have some degree of impact on how or where permanent residential, commercial, or industrial development and roads could occur. The City’s first step in developing a constraint map for the AUAR was to inventory environmental features and development patterns in the project area. GIS computerized maps were made to display multiple layers of information (such as wetlands, floodplains, soils, terrain slope, natural communities, etc.). These features were then ranked as to how they could potentially constrain future development. A composite map of constraints (Figure 1-8) was used to help define the development scenario for the project area and to show where unacceptable environmental impacts should be avoided, minimized, or mitigated.

4.3.1 Constraint Ranking

Inventoried features were assigned a “ranking” to determine how they might affect the development scenario. Existing local, state, and federal laws containing environmental protection provisions were the primary factors that determined the “ranking” each feature received. To a lesser degree, physical barriers to construction were also considered.

The following criteria were established to assess the level of constraint caused by each feature identified during the AUAR inventory process.

- **Level 1 (High)** - Areas with the highest level of constraint, due to very restrictive regulatory criteria that will likely preclude residential and commercial development.
- **Level 2 (Moderate)** - Areas with a moderate level of constraint, due to less restrictive regulatory criteria that will likely affect the density of residential and commercial development. Mitigation is frequently required for impacting many of these features.
- **Level 3 (Low)** - Areas with a low level of constraint, due to the absence of regulatory criteria that are not likely to preclude residential and commercial development. These areas could be more densely developed.

Measures to avoid, minimize, or mitigate impacts to high and moderate constraints are referenced in the Mitigation Plan. Inventoried features are shown below with their corresponding ranking. Some features ranked as low-level constraints were recommended by TAC members for further consideration of alternative environmental protection or enhancement measures. These features are shown below in the Level 3 (Low) “Flagged” category and are discussed in more detail in Part I, Section 4.3.2.

Level 1 (High)

- Existing roads.
- Water features (rivers, streams, lakes).
- Existing parkland (none in project area).
- Floodway.
- Slopes greater than 18 percent in shoreland zoning district (none in project area).
- Slopes greater than or equal to 26 percent in all areas.
- Natural Heritage Information System - endangered species locations (none in project area).
- Developed parcels.

Level 2 (Moderate)

- 100-year floodplain (other than floodway).
- Floodprone Areas (as indicated by floodplain soils).
- National Wetland Inventory mapped wetlands.
- Wetland indicator soils.
- Slopes 18 to 25 percent.

- Transitional lands adjacent to existing development.
- Spring/seep locations.
- Sinkhole locations.
- Natural Heritage Information System - threatened species locations.

Level 3 (Low)

- 500-year floodplain.
- Planted coniferous forest.
- Oak forest.
- Lowland hardwood forest.
- Other deciduous forest.
- Oak savanna or woodland.
- Known or likely prairie remnants.
- Grassland, old pasture with possible prairie remnants.
- Shrubland with possible prairie remnants.
- Lands difficult to serve because of high costs to extend infrastructure (typically due to topographical constraints and the need for lift stations).
- Shallow depth to bedrock.

Level 3 (Low) “Flagged”

- Outstanding biodiversity significance.
- High biodiversity significance.
- Moderate biodiversity significance.
- Natural Heritage Information System - special concern species locations.
- Trapp Burial Mound area recorded archaeological site (suspect).
- Areas within the high potential for cultural resources along creeks.

- Upland areas of moderate potential for archaeological sites.
- Potential historical/architectural sites/areas.
- Aggregate (sand and gravel) resources.
- Decorah shale and Decorah-Edge (as related to construction issues).

4.3.2 Flagged Features

Beyond environmental protection and mitigation measures already provided for by law, the City (as the RGU), considered additional “unacceptable environmental impacts” in the AUAR study area. The City reviewed non-regulatory measures for further environmental protection and made recommendations for stewardship opportunities to be included in the Mitigation Plan that could serve to help mitigate currently unregulated environmental impacts for all Level 3 Low and Level 3 Low Flagged Features. Examples of non-regulatory measures requested by the TAC that have been forwarded to the ROPD for consideration and action include:

- Increasing the environmental resource awareness of property owners, developers, planners, elected and appointed officials through education and training.
- Developing incentives to promote alternative development styles, such as cluster developments, that achieve higher allowable residential densities over a smaller area to preserve nearby environmental resources.

Specific examples of preservation or enhancement techniques for these “flagged” features suggested by the TAC include:

- Establishing buffers around unique habitats.
- Controlling invasive species.
- Improving or expanding native plant or animal communities or habitat.
- Obtaining conservation easements.
- Maintaining habitat connectivity via development of “Greenways.”

4.3.3 Input to Development Scenario

As part of establishing the development scenario (Figure 1-9), land use patterns were considered that accounted for existing development, developable residential lands, and areas that are considered ‘highly constrained’ (Figure 1-8) and are therefore undevelopable. Highly constrained areas as described in previous sections consist of floodways, water bodies, and other physical features that are either barriers to construction or features rigorously regulated by law. Moderate constraints that can be mitigated (through avoidance, minimization, or compensatory mitigation) or low constraints that are unregulated did not

affect the overall density applied to the hypothetical development scenario because it cannot be assumed that they will prohibit development. The location of varying levels of residential density within the project area reflected existing and planned infrastructure capacity, existing development patterns, approved land uses and zoning districts, along with the locations of cultural and natural resource features.

5.0 SUMMARY

Part I of this AUAR has provided an overview of the project background, AUAR process, the methods used to establish a development scenario, and the natural and cultural resources inventory results. Information reported in Part I was the primary basis for evaluating and completing Part II. The following section, Part II of this document, consists of the EAW form and response to questions as modified by EQB AUAR Guidance as of October 2, 2000. Part III is the Mitigation Plan.

PART II-MARION ROAD TRUNK SANITARY SEWER PROJECT ALTERNATIVE URBAN AREAWIDE REVIEW RESPONSE TO QUESTIONS

This section consists of the Environmental Assessment Worksheet (EAW) form and response to questions as modified by Environmental Quality Board (EQB) Alternative Urban Areawide Review (AUAR) Guidance as of October 2, 2000. The EAW question is shown in bold text, EQB AUAR guidance is shown in italicized text, and the response to the question is shown as regular text.

AUAR Guidance as Revised by EQB staff October 2, 2000

This guidance has been prepared by the EQB staff to assist in the preparation of AUAR documents. It is based on the directive of Minnesota Rule part 4410.3610, subp. 4 that “the content and format [of an AUAR document] must be similar to that of an EAW, but must provide for a level of analysis comparable to that of an EIS for impacts typical of urban residential, commercial warehousing, and light industrial development and associated infrastructure.”

General AUAR Guidance

This guidance is based on the items of the standard EAW form (February 1999 version); the numbers listed below refer to the item numbers of that form. Except where stated otherwise, the information requested here is intended to augment (or clarify) the information asked for on the EAW form; therefore, the EAW form and the guidance booklet “EAW Guidelines” must be read along with this guidance.

The information requested must be supplied for each of the major development scenarios being analyzed, and it is important to clearly explain the differences in impacts between the various scenarios.

If this guidance indicates that an EAW item is not applicable to the AUAR, the item # and its title (the text in bold print on the EAW form) should be included with an indication that the EQB guidance indicates that no response is necessary in an AUAR (as opposed to just skipping reference to that item at all).

One general rule to keep in mind throughout the preparation of the AUAR document is that whenever a certain impact may or may not occur, depending on the exact design of future developments, the AUAR should cover the possible impacts through a “worst case scenario” analysis or else prevent the impacts through the provisions of the mitigation plan. Failure to cover possible impacts by one of these means risks the invalidation of the environmental review exemption for specific development projects.

1.0 PROJECT TITLE

Marion Road Trunk Sanitary Sewer Project Alternative Urban Areawide Review

2.0 PROPOSER - CITY OF ROCHESTER

Contact Person Barbara J. Huberty
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Address: Rochester Public Works Department
201 4th Street SE
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3.0 RESPONSIBLE GOVERNMENTAL UNIT – CITY OF ROCHESTER

Contact Person Barbara J. Huberty
Title: Environmental and Regulatory Affairs Coordinator
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Rochester, MN 55904-3740
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Fax: 507/281-6216
E-mail: bhuberty@ci.rochester.mn.us

4.0 REASON FOR EAW PREPARATION

The completion of this AUAR became a special condition of the “Revised Permit for the Construction and Operation of a Disposal System” for the Marion Road Trunk Sanitary Sewer Project (No. 23305, April 21, 2000).

5.0 PROJECT LOCATION

County: Olmsted County **City/Township:** Marion Township
Sections: S¹/₂ 4, S¹/₂ 7, 8, 9, N¹/₂ 18, 17, 16, NE¹/₄ 19, N¹/₂ 20, 21, 22, 28, W¹/₂ 23
Township: 106N **Range:** 13W

Attach each of the following to the EAW:

AUAR Guidance: a. The county map is not needed for an AUAR. b. The USGS map should be included. c. Instead of a site plan, include: (1) a map clearly depicting the boundaries of the AUAR and any subdistricts used in the AUAR analysis; (2) land use and planning and zoning maps as required in conjunction with items 9 and 27; and (3) a cover type map as required for item 10. Additional maps may be included throughout the document wherever maps are useful for displaying relevant information.

Figure 1-1	General Location
Figure 1-2	AUAR Project Area
Figure 1-3	Existing and Proposed Trunk Sanitary Sewer Service
Figure 1-4	Natural Resource Inventory
Figure 1-5	Surface Water Features
Figure 1-6	Geologic Inventory
Figure 1-7	Cultural Resource Inventory
Figure 1-8	Constraint Map for Development Scenario
Figure 1-9	“Hypothetical” Development Scenario
Figure 2-1	Existing Land Use
Figure 2-2	Rochester Urban Service Area Land Use Plan
Figure 2-3	Olmsted County Land Use Plan
Figure 2-4	Existing Zoning – City of Rochester and Olmsted County
Figure 2-5	Proposed Stormwater Management System
Figure 2-6	Proposed Stormwater Conveyance System
Figure 2-7	Existing Intersection and Roadway Level of Congestion
Figure 2-8	Potential Roadway Improvements and Mitigations
Figure 2-9	Development Inquiries
Figure 2-10	Existing Development Patterns
Figure 2-11	Soils Map

6.0 DEVELOPMENT SCENARIO DESCRIPTION

AUAR Guidance: The description section of an AUAR should include the following elements for each major development scenario:

- *The anticipated types and intensity (density) of residential and commercial/warehouse/light industrial development throughout the AUAR area.*
- *The infrastructure planned to serve development (roads, sewers, water, stormwater system, etc.). Roadways intended primarily to serve as adjoining land uses within an AUAR area are normally expected to be reviewed as part of an AUAR. More “arterial” types of roadways that would cross an AUAR area are an optional inclusion in the AUAR analysis; if they are included, a more intensive level of review, generally including an analysis of alternative routes, is necessary.*
- *Any information about the anticipated staging of various developments, to the extent known, and of the infrastructure, and how the infrastructure staging will influence the development schedule.*

6.1 Project Summary for EQB Monitor

Provide a project summary of 50 words or less to be published in the *EQB Monitor*.

Rochester initiated a Water Quality Protection Program to extend sanitary sewer and water to homes and businesses with failing and substandard septic systems primarily in areas with near-surface groundwater. The MPCA included an AUAR as a special permit condition to construct and operate the new trunk sanitary sewer system.

6.2 Introduction

In December 1998, the City of Rochester initiated a Water Quality Protection Program (WQPP) to extend sanitary sewer and water to homes and businesses with failing and substandard septic systems and private wells primarily in areas surrounding the City with near-surface groundwater. Several hundred homeowners near Rochester's southeastern boundary petitioned for this service. The Marion Road Trunk Sanitary Sewer Project was developed in response to the City Council's acceptance of petitions for service to homes in Sewer Service Area 16. The completion of this AUAR became a special condition of the "Revised Permit for the Construction and Operation of a Disposal System" for the Marion Road Trunk Sanitary Sewer Project (No. 23305, April 21, 2000).

The area subject to this AUAR (Figures 1-1 and 1-2) includes approximately 4,316 acres located to the southeast of the City of Rochester in Marion Township, adjacent to the City's corporate limits. This area consists of rolling topography with two valleys drained by Bear Creek and Badger Run. Two major roadways serve the project area. State Trunk Highway (TH) 14 runs east and west spanning the area's northern edge and Marion Road runs northwest/southeast through the area. Marion Road has a unique history of commercial development dating back to the mid-1900s. The area consists of diverse land uses including single-family housing developments, hobby farms, agriculture (row crops), horse farms, aggregate mining operations, light industry, and limited highway commercial uses.

The AUAR assumes only one hypothetical development scenario across the entire project area in order to evaluate development impacts in a cumulative and connected manner. This approach enables the RGU to anticipate potential impacts associated with the long-term development of the area and take steps to prevent, minimize, or mitigate for unacceptable impacts. The development scenario is based on existing City and County Comprehensive Plans.

6.3 City and County Comprehensive Planning

AUAR Guidance note: The RGU must assure that the development described complies with the requirements of 4410.3610, subpart 3 (and also that it properly orders the AUAR and sets the description in that order as required by 4410.3610, subpart 3)

The hypothetical development scenario (Figure 1-9) assumes development consistent with the land use patterns identified in the *City of Rochester Urban Service Area Land Use Plan (City Plan)* adopted in 1979. The *City Plan* assumed the eventual urbanization of the project area and identifies the bulk of the project area as low-density residential development. Some limited commercial and industrial uses are also anticipated along Marion Road and as future neighborhood commercial nodes. However, these uses are essentially limited to existing facilities with some expansion potential of industrial uses along Marion Road. It is also important to note that the *City Plan* is consistent with the more current planning efforts of Olmsted County. The 1995 *Olmsted County General Land Use Plan (County Plan)* designates the majority of the project area (67 percent) as "25 Year Urban Service Area (USA)." This assumes that the area in this designation will be annexed into the City of Rochester and served by municipal infrastructure within the next 25-year period. Adjacent to the USA are the "50 Year Urban Reserve Area (URA) that comprises about 25 percent of the project area and acts as a holding zone for future urban development, and the Suburban Development Area ("SDA") that comprises about 8 percent of the project area and is a more permanent rural residential development pattern. The term "SDA" in this AUAR refers to the "Suburban Development Area" as defined by the *County Plan*. The term suburban in the *County Plan* refers to suburban housing patterns as large lot development on private sewer and water systems.

Existing land uses in the project area are illustrated in Figure 2-1. The City of Rochester's future *City Plan* is shown in Figure 2-2. The *County Plan* designations within the project area are illustrated in Figure 2-3.

6.4 Development Scenario

It is important to remember that *the hypothetical development scenario reflects the highest reasonable and feasible density that could be expected to occur in the project area* given the designated land use patterns and the logical zoning district that would apply to the area upon its annexation into the City of Rochester. This is done to help maintain consistency between future developments within the project area such that unanticipated environmental impacts and less rigorous, independent environmental reviews are avoided. In most cases, independent environmental reviews can be avoided if future development proposals are consistent with the AUAR and Mitigation Plan.

The hypothetical development scenario was adopted by the City Council on January 23, 2002. The scenario does not preclude or supercede the City and County official plans, ordinances, and development process, or change opportunities for interested citizens to participate in the development process. Table 2-1 identifies existing (2001) land use and planned land use upon build out based on the hypothetical development scenario.

TABLE 2-1

**EXISTING (2001) AND HYPOTHETICAL DEVELOPMENT SCENARIO LAND USE
Marion Road Trunk Sanitary Sewer Project AUAR**

Land Use Category	Existing Land Use 2001 (Developed areas in acres)	Hypothetical Development Scenario Land Use (full build out in acres)
Low Density Residential	893	3,178*
Commercial	14	14
Industrial	25	72
Park and Open Space	33	TBD**
Vacant/Agricultural/Undeveloped Area	2,440	0
Suburban Development Area	0	108
Transportation (road rights-of-way)	377	TBD**
Environmental Features (floodways, water bodies, steep slopes, and other high constrained features)	534	534
Total Acres	4,316	4,316

* This figure is calculated to include lands that would be dedicated for park needs and road right-of-way, as well as areas that may be used as small commercial nodes.

** To be determined based on specific future development proposals.

Existing land use is illustrated in Figure 2-1 and the Hypothetical Development Scenario is illustrated in Figure 1-9.

Originally, the project area boundary for the Marion Trunk Sanitary Sewer Project AUAR discussed with the MPCA was developed using an estimation of sewer capacity from the trunk sewer line extension based on average development densities across a broad geographic area. As part of the AUAR process, the project area was refined based on a more complete assessment of constraints, existing and expected development patterns, and the hypothetical development scenario adopted by the City Council as part of the Order for Review, in addition to pipe capacity calculations. The Phase 1 and 2 areas associated with the original project area were delineated to negotiate allowable sewer connections prior to completion of the AUAR. This terminology is not applicable for the AUAR process, which looks at a “project area.”

After evaluating these factors, the project boundary presented in Figure 1-2 and evaluated in this AUAR was developed. The revised project area boundary also acknowledges that the majority of the SDA is not likely to ever be served by sanitary sewer because construction was completed in accordance with regulations to reserve lot space for septic system repair or replacement, and because the low development densities render service economically impractical. County Road 11 was selected as the boundary through the SDA. Several small-lot subdivisions that are adjacent to County Road 11 may have a need for future sewer connection should their septic systems fail. Sewer capacity calculations used to establish the revised project boundary took into account the contributions from small-lot subdivisions even though they may never opt to connect. The remaining undeveloped portion of the URA was also added to the project area.

Current natural community land cover is presented in Table 2-2. The future level of impact cannot be predicted at this time since specific development plans are not in place.

TABLE 2-2

**CURRENT NATURAL COMMUNITY LAND COVER
Marion Road Trunk Sanitary Sewer Project AUAR**

Land Classification	Existing Acres
Planted Coniferous Forest	30.60
Oak Forest	531.06
Lowland Hardwood Forest	589.62
Other Deciduous Forest	303.96
Oak Savanna or Woodland	41.65
Known or Likely Prairie Remnants	22.35
Grassland/Old Pastureland w/Possible Prairie Remnants	717.12
Shrubland w/Possible Prairie Remnants	243.83
National Wetland Inventory Wetlands	91.31
Total Area	2571.47*

* The total acres are approximate and some overlapping of land cover types occurs.

6.5 Residential Development

The primary land use designation in the project area is low-density residential. As stated in the *City Plan*, these areas are “...intended primarily for single family housing and, where appropriate, other single, isolated uses that are of a similar character and intensity that are supportive of the neighborhood (such as neighborhood groceries or small offices)...” The *City Plan* policy language suggests that neighborhoods be designed to contain a mixture of housing types using good design to maintain a lower density residential character and to minimize development impacts such as excessive traffic. The *City Plan* states: “Mixtures of single- and multi-family uses that arise as a result of planned unit developments in low density areas are also consistent with the Plan.” Furthermore, it encourages a range of densities and housing types to provide housing choices and affordability. The types of low-density residential developments that are allowed are more clearly defined through the use of zoning districts but would generally consist of single-family detached units, townhome and condominium units, and limited multi-family apartments through the “incentive or restrictive” processes.

The likely zoning district in the project area at the time of annexation will be the R-1 (Mixed Single Family) district that requires a minimum lot size of 6,000 square feet for single-family detached houses. However, other zoning districts may be appropriate for the project area. The *City of Rochester Code of Ordinances* provides for two different zoning districts (I-Interim and H-Holding). These zones would be applicable at the time of annexation and would allow time for the owner or the City to develop specific plans for the area and request specific zoning and, if necessary, an amendment to the *City Plan*. These zoning designations offer the greatest level of flexibility to the private landowner. Other low-density residential zoning districts that are deemed to be representative could also apply in the project area once annexation occurs. These are:

- *R-Sa (Mixed Single Family Overlay)*-intended to maintain the character of existing large-lot, single-family residential areas. Lot sizes will vary.
- *R-1x (Mixed Single Family Extra)*-intended to encourage a greater variety of housing types and styles with a slightly greater overall density.
- *R-2 (Low Density Residential)*-intended to encourage a mixture of residential dwelling types that are of an overall low density; this can include three and four unit multi-family dwellings.

Existing zoning designations for the project area are illustrated in Figure 2-4.

While zoning rules and regulations play an important role in assuming how much development may occur in an area, market realities must also be considered. Typical housing patterns yield a density between 2 and 2.5 units per acre. These patterns usually consist of residential lots ranging from 10,500 to 15,000 or more square feet in size. The high demand for a single-family detached home with a two or three car garage severely limits the utilization of 6,000 square-foot lots. On the other hand, the aging of the baby boom generation has also sparked an increased demand for the townhome and condominium style of housing. These housing patterns result in higher densities. Finally, environmental and geological constraints also limit the amount and intensity of residential development that can occur in the project area.

Additional factors that were considered in creating the hypothetical development scenario were provisions in Chapters 63 and 64 of the *City of Rochester Code of Ordinances* that apply a variety of lot development and site design policies to certain areas based on direction from the *City Plan*. Of particular importance to area residents were situations where vacant lands adjacent to existing large-lot subdivisions would be developed. Transition areas were provided for so that new urban lot sizes would achieve compatibility with adjacent subdivisions.

Land use patterns were considered that accounted for existing development, developable residential lands, and areas that are considered ‘highly constrained’ and are therefore undevelopable. Highly constrained areas consist of floodways, water bodies, steep slopes in excess of 26 percent and other physical features that are either barriers to construction or features rigorously regulated by law. Moderate constraints that can be mitigated (through avoidance, minimization, or compensatory mitigation) or low constraints that are unregulated did not affect the overall density applied to the hypothetical development scenario because it cannot be assumed that they will prohibit development. The City of Rochester land use policies and zoning regulations allow creativity in subdivision design to preserve desirable physical features while not reducing the development potential of a site. The location of varying levels of future residential density within the project area depends on infrastructure capacity, existing development patterns, along with the locations of natural and cultural resource features.

Given the land use mixes prescribed by the *City Plan* and the associated zoning districts described above), the AUAR overall low density residential hypothetical development scenario for new development would average about three residential units per gross acre (Table 2-3). This density takes into account the following:

- In areas with moderate or low development constraints, a specific development project may have an average density as low as one unit per gross acre.
- In areas where minimal constraints to development exist and public infrastructure supports a higher level of development, the densities for a specific project development may have a higher average density of up to six units per gross acre.
- Individual new developments within the project area may be as high as 15 or more units per gross acre in the R-1x or R-2 zoning districts.

The hypothetical development scenario neither precludes less dense development nor promotes more dense development than would otherwise be allowed by approved plans and ordinances.

TABLE 2-3

**PROJECTED RESIDENTIAL HOUSING TYPES AND DENSITY LEVELS
Marion Road Trunk Sanitary Sewer Project AUAR**

Total Vacant Residential Acres	Range of Densities (units per gross acre)	Overall Average Density (units per gross acre)*	Total Number of New Housing Units	Housing Mix SF/MF**
2,392	1 to 15	2.71	6,480	3,160 SF units 3,320 MF units

* Three units per gross acre were assumed for areas designated as low density residential. Some areas fall within the “SDA” land use classification of the *County Plan* and were assumed at one unit per acre.

** SF = Single Family detached.

MF = Multi-family, and represents townhome, condominium, and apartment type housing including senior apartments.

6.6 Commercial/Industrial Development

The majority of the project area is residential as guided by the *City Plan*. However, neighborhood commercial is identified as a desirable use in residential areas to support the concept of livable communities. For this development scenario, two B-5 neighborhood commercial nodes with an estimated 131,760 square feet of space were assumed for the project area. The B-5 district is an acceptable zoning district that allows nodes of less than 10 acres to be developed for neighborhood commercial uses. In many ways, these are encouraged within low-density residential areas to be part of the neighborhood instead of stand-alone, auto-oriented commercial uses, because they provide daily convenience shopping and personal service needs while reducing the need to drive longer distances for single-purpose trips. Neighborhood commercial nodes offering more retail flexibility than the B-5 district are also allowed in Special Districts or Restricted Development areas. (These terms are the current zoning districts that are equivalent to the planned unit development term referenced in Section 6.5.)

Other commercial and light industrial areas with an estimated 579,500 square feet of space were designated where existing non-residential uses were located at the time of the *City Plan* adoption. These areas were designated along Marion Road for future commercial use and largely reflect pre-existing development patterns.

6.7 Infrastructure

6.7.1 Sanitary Sewer

Individual septic systems have historically been used by homes and businesses within the AUAR project area for wastewater management. The septic systems are aging, and in 1998 the City began efforts to provide a sanitary sewer system to the area. The system connects to the City’s existing sanitary sewer system and will convey wastewater to the Rochester Water Reclamation Plant (RWRP). During 2000, the City began installing the following trunk and sub-trunk sanitary sewers that will ultimately provide sewer service to the project area (Figure 1-3).

- Marion Road Trunk Sewer (installed in 2000): Connects to the Willow Creek Trunk Sewer at the southwest corner of McQuillan Field. It then extends along the south line of McQuillan Field to Marion Road and southeast along Marion Road from 30th Avenue SE to 22nd Street SE.
- 20th Street Sub-Trunk Sewer (installed in 2001): Connects to the Marion Road Trunk Sewer near the intersection of 20th Street SE and Marion Road and extends east along 20th Street SE to 37th Avenue SE.
- Badger Run Sub-Trunk Sewer (to be installed in 2002): Will connect to the Marion Road Trunk Sewer near the intersection of 30th Avenue SE and 22nd Street SE. It then will extend south along 30th Avenue SE to the north side of Badger Run. From here, the sewer will extend east/southeast along the north side of Badger Run to 32nd Street.
- Bear Creek Sub-Trunk Sewer (to be installed in 2002 to 2003): Will connect to the end of the 20th Street project at approximately 37th Avenue SE and will extend to 50th Avenue SE. A future project may extend this subtrunk north along 50th Avenue SE to TH 14.

Local service connections to the Marion Road Trunk Sanitary Sewer Project trunk and sub-trunk sewers will only be allowed for homes and businesses within the AUAR project area if an annexation agreement is signed, and if it is technically and economically feasible. The City Council adopted a policy in 1992 whereby the City does not require any existing home or business owner to connect to City sewer and water when it is installed to serve a particular subdivision, as long as their private septic system and wells are in good operating condition. In subdivisions with available City sewer and/or water services, connection is required when the respective private systems fail.

Future wastewater production rates were determined for the project area based on land area and ultimate land use. The results were used in the design of the trunk and sub-trunk sewer system and are summarized in Table 2-4.

TABLE 2-4

**FUTURE AVERAGE AND PEAK FLOWS FOR DESIGN OF TRUNK SEWER SYSTEM
Marion Road Trunk Sanitary Sewer Project AUAR**

Trunk or Sub-Trunk Location	Tributary Area (acres)	Total Average Flow (MGD)	Total Peak Flow with Inflow (MGD)
20 th Street Sub-Trunk at Marion Road	2834	1.22	4.44
Badger Run Sub-Trunk at Marion Road	2799	1.20	4.39
Marion Road Trunk at Willow Creek Trunk	5633	2.42	8.83
Bear Creek Sub Trunk	Undetermined, currently in planning stage	Undetermined, currently in planning stage	Undetermined, currently in planning stage

Source: Short Elliot and Hendrickson, Inc. and the City of Rochester.

* MGD = million gallons per day

6.7.2 Municipal Water

Approximately 450 wells, ranging from 10 to 610 feet in depth, are recorded within the project area. The majority of the wells are for private domestic use and serve individual users. Rochester Public Utilities (RPU) Well 72, and portions of the Drinking Water Supply Management Areas (DWSMA) associated with RPU Wells 72, 21, and 33, are also located within the project area. These public water supply wells provide water to residents of the City. The wellhead protection planning and delineation of the DWSMAs is currently in progress, so no map of these areas can be included.

The City WQPP to extend sanitary sewer and water to homes with failing and substandard septic systems or wells primarily in areas surrounding the City with near-surface groundwater is intended to improve and protect groundwater quality in the Rochester groundwater basin. Consequently, as sanitary sewer and water lines are extended into the project area, it is anticipated that hundreds of wells will be abandoned. The City water quantities to be supplied to the project area will initially correlate directly with the current pumping capacities of existing private water supply wells and ultimately grow to serve the anticipated development within the area.

All wells that are abandoned when City water service is initiated are required to follow rules and regulations established by Minnesota Department of Health (MDH) Minnesota Statutes Chapter 103I and Minnesota Rules Chapter 4725.3850. Any wells retained for private non-domestic use will require a well maintenance permit from the ROPD, must meet water quality standards and cannot be connected to the City water system. Interim development projects may install private wells and septic systems.

A 500,000-gallon water tower was constructed in 2001 in the Rose Harbor Area (at the east end of Harbor Heights Court SE) to serve major portions of the project area. The new water tower replaced a nearby 100,000 gallon water tower which previously served only the Rose Harbor and Marvale areas. A 12-inch water main (replacing existing smaller water mains) is being constructed from the new water tower west and south through the Rose Harbor and Marvale areas to the 20th Street SE and Marion Road area and connected to a 16" water main constructed in 2001 along 30th Avenue SE between Marion Road and Pinewood Road. The new water tower and water main upgrades will provide service (via these high pressure water mains and planned near-future pressure reducing stations at 20th Street SE and at Pinewood Road SE) to the area east of 30th Avenue SE, and areas south of Pinewood Road above an elevation of 1,090 feet.

As the easterly portions of the project area develop, additional water storage will be required. A water storage reservoir (approximately 1,000,000 gallon capacity) is planned for the hillside across 20th Street SE from the former Boy Scout Camp (Camp Kahler). The reservoir would be connected to the main served from the pressure reducing station on 20th Street SE near Marion Road, and would serve the east and north portions of the project area through a trunk main extending east along 20th Street SE and north along 42nd Avenue SE as this area develops. Some of the lower elevation areas north of TH 14, west of 55th Avenue, and east of the Sunnydale Subdivision could also be served by this reservoir. The reservoir would also serve areas along Marion Road through a trunk main extending south from 20th Street SE along 40th Avenue SE. This main would connect at 30th Street SE and Marion Road with a planned trunk water main extending east from the planned pressure reducing station at 30th Avenue SE along Pinewood Road and 30th Street SE, thereby creating a looped main serving the entire southeast portion of the project area. The RPU anticipates that at least one additional water supply well will be needed to serve the project area if full build out occurs.

In order to provide water service to the approximately one square mile area east of 40th Avenue SE and above an elevation of 1,140 feet, a smaller water tower and/or booster station would be required.

Rochester Typical Water Consumption Information (Year-end City-wide 2001 data):

Year-end Residential Customers:	27,589 homes
Population Served (Approximate):	90,000 persons
Average Persons Per Home (Approximate):	3.25 persons/home
Year 2001 Residential Water Sales:	2,134,382,800 gallons (2.134 billion gallons)
Average Daily Customer Water Usage:	212 gallons/home/day 65 gallons/person/day

(RPU uses a 2.25:1 peak day/average day ratio for total water sales – not just residential sales.)

The City Council adopted a policy in 1992 whereby the City does not require any existing home or business owner to connect to City sewer and water when it is installed to serve a particular subdivision, as long as their private well and septic system are in good operating condition. In subdivisions with available City services, connection is required when the respective private systems fail. Consequently, the timing of extension of City sewer and water service to the project area will be driven by individual needs.

6.7.3 Stormwater Management

The City of Rochester developed a *Stormwater Management Plan (Stormwater Plan)* in 1999 to serve as a guide for the expansion of the City's stormwater management system in new development and redevelopment areas. The plan provides technical information to assist the City in developing a stormwater management program to meet some of the forthcoming requirements of the National Pollutant Discharge Elimination System (NPDES) Phase II program. It also provides design information for proposed stormwater basins and stormwater piping. The City incorporated much of the *Stormwater Plan* language in the *City of Rochester Code of Ordinances*.

The majority of the AUAR study area is located within the Bear Creek Watershed District. Small portions of the AUAR study area are located within the Silver Creek, Mayo Run, and a very small portion of the Willow Creek Watershed Districts. Figure 2-5 shows the locations of these watersheds within the AUAR study area. As described in the *Stormwater Plan* and required by ordinance, the City of Rochester will require the construction of sedimentation basins and, where applicable, piping to collect, convey, and provide erosion and sediment control for stormwater as new development occurs. At this time, development in areas upstream of the project area does not have long term stormwater management requirements. Figure 2-6 presents the proposed stormwater conveyance system.

6.7.4 Roadways

The key roadways that serve the project area are:

- TH 14 from 11th Ave (CSAH 1) to 50th Ave (CSAH 11).
- Marion Road (CSAH 36) from TH 14 to 30th St.
- Eastwood Road (CR 144) from Marion Rd (CSAH 36) to 40th Ave.
- 20th Street (CR 143) from Marion Rd (CSAH 36) to 50th Ave (CSAH 11) – plus possible future connection from 11th Ave (CSAH 1) to Marion Rd (CSAH 36).
- 40th Avenue from TH 14 to Eastwood Rd (CR 144) – plus possible future connection from Eastwood Rd (CR 144) to 20th St (CR 143).
- Pinewood Road from 11th Ave (CSAH 1) to 30th Ave.
- 30th Avenue from Marion Rd (CSAH 36) to Pinewood Rd.
- 50th Avenue (CSAH 11) from TH 14 to CR 143 (N JCT).
- TH 14: This highway is an east-west roadway that is functionally classified as a Principal Arterial. Principal Arterials emphasize mobility and are, therefore, designed to serve high speed, longer distance travel. From Marion Road to the east of 40th Avenue, TH 14 is a four-lane divided roadway with a rural design. Farther east of 40th Avenue, TH 14 becomes a two-lane undivided roadway with a rural design. The speed limit on TH 14 west of Marion Road is 40 miles-per-hour (mph). East of Marion Road, the speed limit is 55 mph. TH 14 is currently signalized at its intersections with Marion Road (CSAH 36), East Circle Drive (CSAH 22), and 50th Avenue SE (CSAH 11).
- Marion Road: This is a County State Aid Highway (CSAH 36) that runs mainly northwest-southeast through the project area. Between TH 14 and 40th Avenue, it is functionally classified as a Minor Arterial. Minor Arterials interconnect with and augment Principal Arterials. They tend to provide slightly lower levels of mobility and slightly higher levels of land access than Principal Arterials. South of 40th Avenue, Marion Road is functionally classified as a Major Collector. Major Collectors provide both land access and local circulation within residential, commercial, and industrial areas. From TH 14 to the Bear Creek Bridge, Marion Road is a five-lane undivided roadway with a continuous left turn lane. South of the bridge, Marion Road is a two-lane undivided roadway. The speed limit on Marion Road through the four-lane section is 40 mph.
- Eastwood Road: This roadway is an east-west County Road (CR 144) that can be classified as a local roadway. Its primary function is to provide land access first and local circulation second. Between Marion Road and 40th Avenue, Eastwood Avenue is a two-lane undivided roadway with a rural design. The speed limit on Eastwood Avenue is 40 mph.

- 20th Street: This roadway is an east-west County Road (CR 143) that is functionally classified as a Major Collector. It is a two-lane undivided roadway with a rural design and the speed limit on 20th Street is 40 mph.
- 40th Avenue: This roadway is a north-south roadway that that can be classified as a local roadway. It currently consists of two disconnected road segments; one segment is between TH 14 and Eastwood Road (CR 144) and one segment is between 20th Street and Marion Road. Along both sections, 40th Avenue is a two-lane undivided roadway with a rural design. The speed limit along these sections is 40 mph.
- Pinewood Road: This roadway runs east-west and is functionally classified as an Urban Collector. It also is a two-lane undivided roadway with a rural design and a speed limit between 11th Avenue and 30th Avenue of 35 mph.
- 30th Avenue: This Township roadway is a two-lane undivided roadway and is classified as a local roadway. Its speed limit is not posted but its design suggests a speed limit of no more than 35 mph.
- 50th Avenue: This roadway is a north-south County State Aid Highway (CSAH 11) that is functionally classified as Major Collector. It is also a two-lane undivided roadway with a rural design. From TH 14 to south of CR 143, the speed limit is 40 mph.

An analysis of existing traffic conditions revealed that the TH 14/Marion Road intersection and the Marion Road/Eastwood Road intersection currently experience traffic congestion in the PM peak hour. All of the other key intersections and roadways are considered to be uncongested. Figure 2-7 displays the level of congestion under existing conditions.

An analysis of year 2025 conditions with and without the development scenario revealed that a worsening of congestion is expected by 2025 regardless of whether the project area is developed. Even without any new development in the project area, roadway enhancements were found to be necessary to alleviate congestion forecasted by 2025. If development were to occur in the project area as planned, it is expected that additional roadway enhancements would be needed by year 2025. The enhancements needed due to traffic increases from new development are identified as mitigations. Roadway enhancements that were forecasted to be needed even if no new project area development occurs are identified as improvements. Figure 2-8 summarizes the potential roadway improvements and mitigations forecast to be necessary by 2025. It should be noted that periodic traffic monitoring should occur in the future on the key roadways in the project area in order to determine if these improvements and mitigations will actually be necessary. Appendix B provides a more detailed discussion of the traffic impacts.

6.8 Parks, Trails, and Natural Resource/Open Space Preservation

There are currently no City or County Parks within the project area. The *City Plan* contains policy direction that supports accessibility to neighborhood and community parks and the preservation and enhancement of natural resources and open space. Part of the City's park dedication strategy is to utilize floodplain and low-lying, floodprone areas for open space and athletic fields that create minimal flood damage potential. As required by *Rochester's Parkland Dedication Ordinance*, development projects must include park elements as part of their development projects. The City also has a

Parkland Acquisition Plan. This *Parkland Acquisition Plan* contains direction for the development of two future park sites in the project area including Joyce Park and Kepp Park (Figure 2-2).

Environmental corridors along Badger Run and Bear Creek provide opportunities for future passive and active recreational trails that connect environmental features to recreational parks and to residential neighborhoods. The creation of environmental corridors along narrow trail connections that may stretch between existing natural resources such as areas of steep slopes, low-lying wetlands, or other open spaces could add value to a development project. Much of the project area has been disturbed for row crop agricultural practices and as row cropping eventually gives way to residential development, these areas could be restored to their native habitat as part of a development project. Restoring some of the native vegetation along these corridors could help create environmental corridors and a connected trail system. The *City Parkland Acquisition Plan* and *Stormwater Plan* both support the preservation of environmental corridors that serve as drainage waterways for the region. The AUAR and Mitigation Plan will be submitted to the Rochester Park and Recreation Department for consideration in park planning.

The *County Plan* also considers the protection of natural resources and the environment. The intent of the *County Plan* is to protect important resources from being lost to development or damaged by poor management. The policies that support a compact settlement pattern and orderly development are consistent with environmental protection by encouraging energy savings from reduced travel, by reducing travel-related air pollution, and by protecting important resources from development. Applying this philosophy, the County has identified USAs/URAs for future development and resource protection areas beyond these boundaries. The AUAR project area is within the designated USA/URA.

Resources addressed by the *County Plan* include open space, rivers and shorelands, scenic and diverse landscapes, outdoor recreation areas, unique landscapes and habitat, wellhead protection areas, and clean air and water. The intent of the *County Plan* is first to protect resources by determining land uses that have the least impacts, and second, where these resources are affected by development, to require development design and land management to mitigate resource impacts. According to the *County Plan*, development activity should avoid or mitigate disruption of the following areas:

- Surface water resource areas: wetlands, calcareous fens, trout streams, shorelands, and floodplains.
- Important landform features: bluffs, rock outcroppings, cliffs along stream or river valleys, and areas with relatively high sinkhole concentrations.
- Sensitive lands and landscapes: wetlands, habitat of state or federal endangered or threatened species, high value natural communities, lands rated as high to very high sensitivity to groundwater pollution, steep slopes, and wellhead protection areas.

Olmsted County adopted land use, land development, and resource management policies as part of the *County Plan* that identify how they will accommodate the demands for the area's limited land resources while protecting the public's interest in the long-term use and management of those areas. These policies include:

- **Sensitive Environmental Areas:** The following areas should be protected and their development should be discouraged: areas prone to unstable environmental conditions including floodplains, sinkhole concentrations, and steep or unstable slopes; areas sensitive to human impacts including areas prone to groundwater pollution, soils with severe limitations to development, public waters, wetlands, bluffs and related natural resources; and areas that may present an unacceptable risk to human health due to present or past pollution.
- **Innovative Site Design:** Land development regulations should encourage innovative site design for urban and suburban development (both residential and non-residential) that protects the natural features and functions of the landscape, minimizes the life-cycle costs of future public services and facilities, and encourages the use of alternatives to the private automobile.
- **Open Space Provision and Environmental Protection:** In areas outside municipalities, encourage the dedication of land, money in lieu of land, or conservation easements for the purpose of providing neighborhood open space and protecting sensitive environmental areas or significant natural features.
- **Environmental Impact:** Where urban and suburban development patterns and individual development proposals cannot avoid areas with significant natural features, development should be designed to minimize adverse impacts.
- **Runoff Control:** Surface water runoff from industrial, commercial, and residential land uses should be controlled. Generally, the rate of runoff from the developed area should not exceed its pre-development level. Accelerated erosion should not occur.
- **Environmental Corridors:** The County, City, and affected state agencies should create systems of environmental corridors in the urban, suburban, and rural areas of the county. Environmental corridors should include floodplain areas, stream corridors, shoreland areas, wetlands, state natural resource lands, natural resource oriented county and city parks, reservoir sites, areas of unique habitat for flora or fauna, wildlife corridors, and bluff areas within shorelands. The acquisition of land and easements should be focused on these areas, especially where there is a possibility to connect large tracts of natural habitat in good condition.
- **Ecosystem Protection:** Critical areas should be managed so as to protect natural ecosystems. Critical areas include river and lake shorelands; wetlands; trout streams; public waters; wildlife management areas; natural resource oriented parks; reservoir sites; habitat for significant fauna and flora; areas highly sensitive to groundwater pollution; wellhead protection areas; important scenic areas; and steep slopes, ridge tops, and bluff lands.
- **Resource Conservation:** Developers should be encouraged to conserve water and energy and to enhance groundwater recharge through the use of appropriate landscaping and site design in urban and suburban development.

- **Shoreland Management:** Shoreland areas should be managed so as to minimize the destruction of existing vegetation, soil erosion from shoreland sites, and streambank erosion.

The Olmsted County Environmental Commission recommended the following principles (as listed in the *County Plan*) to the County Board and the Olmsted County Planning Advisory Commission to guide environmental decision-making in Olmsted County:

- Identify, emphasize, and maintain local landscape characteristics that provide a “sense of place” for the region and communities.
- Preserve and protect groundwater, wetlands, lakes, streams, and rivers.
- Maintain and enhance the integrity and diversity of biological systems.
- Develop lifestyles that promote efficient and equitable use of natural resources.
- Develop community design patterns that promote efficient and equitable use of natural and human resources.
- Adopt practices and technologies that maximize efficiency of resource use and minimize waste generation.

6.9 Staging

The project area is directly adjacent to the City of Rochester Corporate Limits. Approximately 35 percent of the project area is currently covered by orderly annexation agreements between the City of Rochester and Marion Township. These agreements allow for the orderly extension of City utilities to these areas. Landowners in areas not covered by orderly annexation agreements may independently initiate the annexation process and therefore no staging pattern has been established for these circumstances. Part I, Section 1.0 of this document provides additional information on this development and annexation process. City plans for the extension of sewer infrastructure co-evolve with development proposals. The City is aware of several development interests from landowners and developers. To the extent they are known, potential development interests are illustrated in Figure 2-9. Table 2-5 presents subdivisions served by sewer and water service stages, to date.

TABLE 2-5

**SUBDIVISIONS SERVED BY SEWER AND WATER SERVICE STAGES
Marion Road Trunk Sanitary Sewer Project AUAR**

Sewer/Water Stages	Construction Date	Subdivisions Served*
Marion Road Trunk Sewer	2000	Marvale Whynaught Court Samelians
20 th St. Sub-Trunk Marion Road to 37 th Avenue SE	2001	20 th St. SE Nelson Court Christopher Court Marion Road Southside
Badger Run Sub-Trunk	2002	Rose Haven Kahouns Crystal Springs Thomas Vandals Cedar Park
Bear Creek Sub-Trunk 37 th Ave. SE to 50 th Ave. SE	2002/2003	To be determined
50 th Ave. Sub-Trunk	To be determined	To be determined

* Listed subdivisions existed prior to extension of the sewer and water stages that will serve them.

6.10 Air Quality

A microscale analysis was performed to evaluate the air quality affect of the Marion Road Trunk Sanitary Sewer Project hypothetical development scenario at the intersection of TH 14 and Marion Road. A mobile source microscale analysis focuses on the impacts of motor vehicles at intersections. This analysis considers carbon monoxide (CO). Since CO is emitted at greater levels during the idle mode, and acceleration and deceleration modes, CO concentrations are generally highest around intersections. Microscale analysis looks at a smaller area of impact (the intersection), as opposed to a mesoscale analysis that focuses on the emissions of motor vehicle over a much larger area. This intersection was selected for evaluation because traffic modeling indicated that it would be most impacted by development in the area, resulting in the greatest potential for congestion. The study was designed to evaluate concentrations of CO near this intersection for comparison to state and federal air quality standards.

The microscale analysis was conducted to evaluate the effect of project area traffic on CO concentrations at sensitive receptors, both with (build case) and without (no build case) the implementation of the hypothetical development scenario. Since CO emissions from motor vehicles are greatest during the idling and acceleration and deceleration operating modes, sensitive receptors are located in close proximity to the intersection being evaluated.

Maximum predicted one- and eight-hour CO concentrations at the sensitive receptors around the TH 14/Marion Road intersection are summarized in Section 22.0 and Appendix C as they were predicted during the simultaneous occurrence of defined “worst case” meteorology and peak traffic. The results include the contribution of the intersection and background CO levels.

There were no exceedances of either the one-hour (30 ppm state and 35 ppm federal) or eight-hour (9 ppm both state and federal) CO standards for any case. Maximum one-hour and eight-hour concentrations of 9.7 ppm and 6.7 ppm, respectively, were predicted at receptor R22 for the no build case. Receptor R22 is located along the south side of the TH 14 eastbound approach, about 165 feet west of Marion Road.

In the future, maximum concentrations of 10.3 ppm (one-hour) and 7.1 ppm (eight-hour) were predicted for the build case at receptor R22. For the no-build case, highest one-hour and eight-hour concentrations of 9.5 ppm and 6.6 ppm were predicted at receptor R23. Like receptor R22, receptor R23 is also located along the south side of the TH 14 eastbound approach. Receptor R23, however, is about 250 feet west of Marion Road.

6.11 Vehicle-Related Noise

Two roadway sections were evaluated for vehicle-related noise. The first roadway is 40th Avenue from TH 14 to Eastwood Road and the second is Eastwood Road, just east of Marion Road. These two roadways were selected because they are predicted to carry the highest traffic increase in areas of primarily residential use in the project area and, therefore, could experience the most perceptible traffic noise increase related to sensitive receptors. Graphs showing the future sound levels at varying distances from two roadways are included in Appendix C.

The design hour traffic volumes for the year 2025 were used to predict these sound levels. The graphs depict noise level versus distance from the median centerline of a roadway. Two types of noise abatement criteria were evaluated. A dBA is a unit of measure of sound level. The number of decibels is calculated as ten times the base-10 logarithm of the square of the ratio of the mean-square sound pressure (often referred to as frequency weighted), and the reference mean-square sound pressure of 20 μ Pa, the threshold of human hearing. The A-weighting network de-emphasizes the high (6.3 kHz and above) and low (below 1 kHz) frequencies, and emphasizes the frequencies between 1 kHz and 6.3 kHz, in an effort to simulate the relative response of the human ear. The Federal Highway Administration (FHWA) adopted a sound level of 67 dBA, LEQ, for residential areas and 72 dBA, LEQ, for commercial/industrial areas. LEQ is the equivalent steady-state sound level that in a stated period of time contains the same acoustic energy as a time-varying sound level during the same period. Minnesota has adopted daytime sound levels of 65 dBA L_{10} for classification 1 (residential) areas and 70 dBA L_{10} for classification 2 (commercial/industrial) areas. The L_{10} is the sound level exceeded 10 percent of a specific time period. In general, Minnesota's noise abatement criteria are more stringent than FHWA's. Any location along a roadway capacity improvement project that approaches or exceeds these thresholds should be investigated for feasible and reasonable noise abatement measures in the development of the project.

Table 2-6 summarizes the minimum recommended distances from the centerline of a roadway to any residential receptor to be below the noise abatement criteria. Currently, all residences and businesses are outside the minimum distance from the centerline of 40th Avenue and will be in compliance with federal and state noise abatement requirements. However, Eastwood Road just east of Marion Road has a business and several residences within the minimum distance from the centerline of Eastwood Road are currently out of compliance with federal and state residential noise requirements. These businesses and residences will continue to be out of compliance with higher traffic levels that will occur as development

in the area occurs. Noise walls are sometimes considered as mitigation when numerous structures are affected. In urban areas noise walls are typically not practical due to the need of the affected parties to maintain access points from the main roadway. Therefore, no mitigation is recommended for these structures.

TABLE 2-6

**TRAFFIC NOISE SUMMARY TABLE
Marion Road Trunk Sanitary Sewer Project AUAR**

Noise Abatement Categories	Noise Abatement Criteria	Minimum Distance from Centerline of Road that Residential Noise Criteria are Met	
		40 th Avenue	Eastwood Road
Federal - Land Use Category B	67 dBA (Leq)	66 ft.	62 ft.
Minnesota - Classification 1 (Daytime)	65 dBA (L ₁₀)	122 ft.	122 ft.
Minnesota – Classification 2 (Daytime)	70 dBA (L ₁₀)	57 ft.	54 ft.

7.0 PROJECT MAGNITUDE DATA

AUAR Guidance: The cumulative totals of the parameters called for should be given for each major development scenario, except that information on “manufacturing,” “other industrial,” “institutional,” “agricultural.” and “building heights” is optional.

Table 2-7 presents project magnitude data.

TABLE 2-7

**PROJECT MAGNITUDE DATA
Marion Road Trunk Sanitary Sewer Project AUAR**

Total Project Acreage	4,315 Acres
Number of New Residential Units	6,480 dwelling units
Single-Family Detached	3,160 dwelling units
Multi-Family Attached	3,320 dwelling units
Non-Residential Square Footage	
Neighborhood Commercial/Retail*	131,760 square feet
Industrial	579,500 square feet

* Assumes two neighborhood commercial nodes at 8 to 10 acres in size each. The exact location of these nodes is dependent upon specific development plans.

8.0 PERMITS AND APPROVALS REQUIRED

List all known local, state and federal permits, approvals and financial assistance for the project. Include modifications of any existing permits, governmental review of plans and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure.

AUAR Guidance: A listing of major approvals and public financial assistance and infrastructure likely to be required by the anticipated types of development projects should be given. This list will help orient reviewers to framework that will protect environmental resources. The list can also serve as a starting point for the development of the implementation aspects of the mitigation plan to be developed as part of the AUAR.

Table 2-8 presents a list of known local, state, and federal permits and approvals. Table 2-9 provides a list of potential infrastructure and public financial assistance.

TABLE 2-8

**LIST OF MAJOR PERMITS AND APPROVALS LIKELY TO BE REQUIRED
Marion Trunk Sanitary Sewer Project AUAR**

Unit of Government	Type of Application	Regulatory Citation
U.S. Army Corps of Engineers	Clean Water Act Section 404/10 Wetland Permits	Section 404 of The Clean Water Act Title 33CFR26 - Water Pollution Prevention and Control Subchapter IV - Permits and Licenses
Minnesota Department of Health	Water Main Plan Review	MN Rules 4720
	Water Well Installation and Well Abandonment Permits	MN Statute Chapter 103I and MN Rules Chapter 4725
U.S. Fish and Wildlife Service	U.S. Fish and Wildlife Service Coordination	Federal Endangered Species Preservation Act of 1973, as amended in 1978, 1982, and 1988;
Minnesota Department of Natural Resources	Protected Waters Permits	MN Statute 103G, Subdivision 15
	Water Appropriations/Dewatering Permits	MN Statute 103G.26
	Utility Crossing Licenses	MN Statute 103G, MN Rules 6115.0810
	Shoreland Management	MN Rules 6120.5000 - 6120.6200
	Natural Heritage Program Coordination	Federal Endangered Species Preservation Act of 1973, as amended in 1978, 1982, and 1988; MN Statutes Chapter 84.0895; MN Rules Chapter 6134
Minnesota Department of Transportation	State Highway Access Permits	
Minnesota Pollution Control Agency	Air Emission Facility Permits	MN Rules 7007
	Indirect Source Permits	Repealed
	401 Grading Permits	
	Section 401 Water Quality Certificates	MN Rules 7001.1420
	NPDES Construction Permits (stormwater)	MN Statute 115, MN Rules 7002
	Sanitary Sewer Extension Permits	MN Statute 155.07, Subdivision 3
	Individual Sewage Treatment System Permit	MN Rules 7080.0310
	Wastewater Permits	MN Rules 7077
	Demolition Permits	Minnesota Pollution Control Agency, MN Rules 7035
	Spill Prevention Control & Countermeasure Plans	MN Rules 7150.0200
	Tank Registration\Licensing	MN Rules 7150.0300
Minnesota State Historic Preservation Office	Cultural Resource Coordination	Section 106 of the Historic Preservation Act, Protection of Historic Properties” (36 CFR Part 800), MN Statutes 138.31-.42, MN Private Cemeteries Act- MN Statute 307.08
Soil and Water Conservation District	MN Wetlands Conservation Act Permits (Administered for Olmsted County)	MN Statute 103G.222-.2373, MN Rules Chapter 8420
Marion Township	Culverts and Roadway Access	
	Right-of-Way and Easement/Utility Vacations	

TABLE 2-8

**LIST OF MAJOR PERMITS AND APPROVALS LIKELY TO BE REQUIRED
Marion Trunk Sanitary Sewer Project AUAR**

Unit of Government	Type of Application	Regulatory Citation
ENVIRONMENTAL * City of Rochester or Olmsted County as depicted under the Regulatory Citation column.	Erosion Control & Surface Water Run-off Permits	Chapter 64, <i>City of Rochester Code of Ordinances</i> . Section 10.20, <i>Olmsted County Zoning Ordinance</i> .
	Floodplain Review	Section 62.800, <i>City of Rochester Code of Ordinances</i> . Article IX, <i>Olmsted County Zoning Ordinance</i> .
	Individual Sewage Treatment System Permits	MN Rules 7080 and Olmsted County Public Health Regulation Number 41.
	Private Water Supply (well) Permits	MN Statutes Chapter 103I and MN Rules Chapter 4725.3850, and Olmsted County Water Well/Water Supply Ordinance.
	Shoreland Review	Section 62.1000, <i>City of Rochester Code of Ordinances</i> . Section 9.10, <i>Olmsted County Zoning Ordinance</i> .
	Solid Waste Management	<i>Olmsted County Solid Waste Management Ordinance #10</i> .
	Erosion Control & Grading Permits (stormwater)	Chapter 64, <i>City of Rochester Code of Ordinances</i> .
	Floodplain Review	Section 62.800, <i>City of Rochester Code of Ordinances</i> .
	MN Wetland Conservation Act Permits	Minnesota Rules Chapter 8420.
	Park Dedication	Section 64.400, <i>City of Rochester Code of Ordinances</i> .
	Substantial Land Alteration & Mining Permits (for excavation &/or filling)	Section 62.1100, <i>City of Rochester Code of Ordinances</i> .
	Water and Sewer Connection Permits	Rochester Public Works.
	Wellhead Protection Area DWSMAs	Minnesota Department of Health, Rochester Public Utilities.

TABLE 2-8

**LIST OF MAJOR PERMITS AND APPROVALS LIKELY TO BE REQUIRED
Marion Trunk Sanitary Sewer Project AUAR**

Unit of Government	Type of Application	Regulatory Citation
DEVELOPMENT* City of Rochester or Olmsted County as depicted under the Regulatory Citation column.	Agricultural Setback Permits	Section 3.06, <i>Olmsted County Zoning Ordinance</i> .
	Building Permits	<i>Uniform Building Code</i> .
	Conditional Use Permits	Section 61.140, <i>City of Rochester Code of Ordinances</i> .
		Section 4.02, <i>Olmsted County Zoning Ordinance</i> .
	Construction Plans	<i>Uniform Building Code</i> .
	Design Modification Permits	Section 60.420, <i>City of Rochester Code of Ordinances</i> .
		Not applicable outside OAA.
	Development Agreements	Section 61.250, <i>City of Rochester Code of Ordinances</i> .
		Chapter Five, <i>Olmsted County General Land Use Plan</i> .
	General Development Plans	Section 61.210, <i>City of Rochester Code of Ordinances</i> .
		Section 4.0 G, <i>Olmsted County Zoning Ordinance</i> .
	Home Occupation Permits	Section 62.278 <i>City of Rochester Code of Ordinances</i> .
		Section 10.02, <i>Olmsted County Zoning Ordinance</i> .
	Incentive Development Approvals	Section 62.600, <i>City of Rochester Code of Ordinances</i> .
		Not applicable outside OAA.
	Interim Development Agreements	Chapter Five, <i>Olmsted County Future Land Use Plan</i> .
	Land Use Plan Amendments	Chapter V, <i>Rochester Urban Service Area Land Use Plan</i> (inside Urban Service/Urban Reserve Area).
		Chapter Six, <i>Olmsted County General Land Use Plan</i> elsewhere.
	Land Subdivision Permit (Preliminary Plat and Metes/Bounds Approvals)	Section 61.220, <i>City of Rochester Code of Ordinances</i> .
		<i>Subdivision Ordinance for Olmsted County</i> .
	Land Subdivision Final Plat Approvals	Section 61.220, <i>City of Rochester Code of Ordinances</i> .
		<i>Subdivision Ordinance for Olmsted County</i> .
	Mobile Home Installation Permits	<i>Section 10.42, Olmsted County Zoning Ordinance</i>

TABLE 2-8

**LIST OF MAJOR PERMITS AND APPROVALS LIKELY TO BE REQUIRED
Marion Trunk Sanitary Sewer Project AUAR**

Unit of Government	Type of Application	Regulatory Citation
DEVELOPMENT* City of Rochester or Olmsted County as depicted under the Regulatory Citation column.	Moving Permits	Section 108, <i>City of Rochester Code of Ordinances</i> .
	Performance Residential Permits	Chapter 62, <i>City of Rochester Code of Ordinances</i> .
		Not applicable outside OAA.
	Rezoning Approvals	Section 60.330, <i>City of Rochester Code of Ordinances</i> .
		Section 4.00, <i>Olmsted County Zoning Ordinance</i> .
	Right-of-Way and Easement/Utility Vacations	Done by Township or City/County Public Works Departments (road authority). City authority is found in Chapter XVII, <i>Home Rule Charter of the City of Rochester, Minnesota</i> .
	Roadway Access Permits	Varies by roadway authority.
	Roadway Improvement Permits	Varies by roadway authority.
	Sign Permits	Section 63.220, <i>City of Rochester Code of Ordinances</i> .
		Section 10.46, <i>Olmsted County Zoning Ordinance</i> .
	Site Development Plans	Section 61.580, <i>City of Rochester Code of Ordinances</i> .
		Not applicable outside OAA.
	Subdivision Variances	Section 60.410, <i>City of Rochester Code of Ordinances</i> .
		Article IX, <i>Subdivision Ordinance for Olmsted County</i> .
	Temporary Use Permits	Section 61.115, <i>City of Rochester Code of Ordinances</i> .
		Section 4.10, <i>Olmsted County Zoning Ordinance</i> .
	Traffic Impact Studies	Section 61.520, <i>City of Rochester Code of Ordinances</i> .
		Not applicable outside OAA.
	Variances (general)	Section 60.410, <i>City of Rochester Code of Ordinances</i> .
		Section 4.08, <i>Olmsted County Zoning Ordinance</i> .
	Zoning Certificates	Section 61.110, <i>City of Rochester Code of Ordinances</i> .
		Section 3.06, <i>Olmsted County Zoning Ordinance</i> .

TABLE 2-8

**LIST OF MAJOR PERMITS AND APPROVALS LIKELY TO BE REQUIRED
Marion Trunk Sanitary Sewer Project AUAR**

Unit of Government	Type of Application	Regulatory Citation
DEVELOPMENT* City of Rochester or Olmsted County as depicted under the Regulatory Citation column.	Demolition Permits	
	Subdivision (Plat) Approval	Section 61.220, <i>City of Rochester Code of Ordinances</i>
	Annexation	MN Chapter 414, Minnesota Statutes
	Housing Certificates for Rental Housing	In City of Rochester, Section 38.05 of the <i>Rochester Code of Ordinances</i> Section 61.120 (Does not apply to OAA if not in City).

- * County jurisdiction is only in areas within the County, but outside of the OAAs only for interim development within the USAs/URAs. The City's jurisdiction includes orderly annexation areas currently outside of the City limits and newly annexed development in the USAs/URAs.

TABLE 2-9
LIST OF POTENTIAL MAJOR INFRASTRUCTURE
AND PUBLIC FINANCIAL ASSISTANCE
Marion Road Trunk Sanitary Sewer Project AUAR

INFRASTRUCTURE	PUBLIC INFRASTRUCTURE/FINANCIAL ASSISTANCE*
Roadway Extension/Modification	Federal TEA-21 funded through FHWA and MnDOT
	County, City, and Township taxes
	County Road (CR) and County State Aid Highway (CSAH) funding if associated with county road system in project area
	MnDOT
	Local transportation improvement districts
Sanitary Sewer Extension/Connections	Public Facilities Authorities (PFA) for State Revolving Fund (SRF)
	WQPP sales tax funding
Stormwater Management Infrastructure	Tax Increment Financing
	CSAH funding if directly associated with a CSAH project
	Stormwater management fees and charges
Parkland Acquisition	MnDNR state funding programs (See MnDNR financial assistance directory July 2001- July 2003)
	Land and Water Conservation (LAWCON) Funds
	Property taxes
Municipal Water	PFA for State Drinking Water Revolving Loan Fund (DWRLF)
Schools	School referendums, levees, and bonds

* Note that these are potential funding sources identified at this time. Additional funding sources may be identified as development occurs in the AUAR project area.

9.0 LAND USE

Describe current and recent past land use and development on the site and on adjacent lands. Discuss project compatibility with adjacent and nearby land uses. Indicate whether any potential conflicts involve environmental matters. Identify any potential environmental hazards due to past site uses, such as soil contamination or abandoned storage tanks, or proximity to nearby hazardous liquid or gas pipelines.

AUAR Guidance: No changes from the EAW form.

The project area consists of approximately 4,316 acres, the majority of which is currently used for agricultural and low-density residential purposes. New development will primarily result in additional low-density and some moderate density residential development potentially with some neighborhood commercial nodes. Some light industrial and commercial areas are already zoned in this area. These uses are compatible with existing and allowable land uses both in the project area and on adjacent lands. Figures 2-1 and 2-10 illustrate existing land use development patterns. Residential development on the fringe of USAs/URAs may be adjacent to active agricultural land uses and may be exposed to related conflicts, such as odors, equipment noise, and pesticide drift. For additional discussion on land use see the response to Question 6.

Potential contaminants are generally minor in low density residential areas and may include possible unknown farm dumps. Current industrial and commercial areas pose the possibility of related contamination, such as service stations with the possibility of site-specific petroleum contamination. The reason for the WQPP is to reduce the potential for groundwater contamination due to failing septic systems. Currently, no reliable mapping for pipelines is available for project areas of this size. Underground utilities are identified on a site specific basis through the GOPHER1 locate service. Also see response to Question 20.

10.0 COVER TYPES

Estimate the acreage of the site with each of the following cover types before and after development:

AUAR Guidance: The following information should be provided instead of EAW information:

10.a Cover Type Map

AUAR Guidance: At least at the scale of a USGS topographic map, depicting:

- *Wetlands – identified by type (Circular 39).*
- *Watercourses – rivers, streams, creeks, ditches.*
- *Lakes – identify protected waters status and shoreland management classification.*
- *Woodlands – breakdown by classes where possible.*

- *Grassland – identify native and old field.*
- *Cropland.*
- *Current development.*

Figure 1-4 shows natural resources such as threatened species and cover types such as planted coniferous forest, oak forest, lowland hardwood forest, other deciduous forest, oak savanna or woodland, known or likely prairie remnants, grassland, old pasture with possible prairie remnants, and shrubland with possible prairie remnants.. Figure 1-5 presents mapping of watercourses, wetlands, lakes, and floodplains. Figure 2-10 shows existing development patterns.

10.b Overlay Map

AUAR Guidance: Showing anticipated development in relation to the cover types; this map should also depict any “protection areas,” existing or proposed that will preserve sensitive cover types. Separate maps for each major development scenario should generally be provided.

Figure 2-1 presents current land use and Figure 1-9 presents future land use for the development scenario that can be viewed in conjunction with Figures 1-4 and 1-5. There are no existing or proposed protection areas.

11.0 FISH, WILDLIFE AND ECOLOGICALLY SENSITIVE RESOURCES

- a. Identify fish and wildlife resources and habitats on or near the site and describe how they would be affected by the project. Describe any measures to be taken to minimize or avoid impacts.**

AUAR Guidance: a. The description of wildlife and fish resources should be related to the habitat types depicted on the cover types maps (of item 10). Any differences in impacts between development scenarios should be highlighted in the discussion.

11.a.1 Wildlife and Fish Resources

There is a variety of wildlife in the AUAR project area due to the diverse types of habitat available. Wetlands, woodlands, grasslands, and croplands found in the area provide good cover and habitat for many common species found in the upper Midwest. Development will result in an overall loss of habitat quantity and quality in the area. In the short term, animals will be displaced by construction activities, moving into other areas where they will be forced to compete for resources and typically experience higher rates of mortality than resident wildlife. In the long term, the ability of the area to support wildlife will be diminished. The frequency of conflicts between humans and wildlife will increase in the form of nuisance wildlife complaints.

11.a.1.1 Wetlands

There are approximately 91 acres of wetlands within the project area. There are no MnDNR protected wetlands located in the project area. Wetlands were identified using National Wetland Inventory (NWI) maps. The wetlands that are present within the project area are depicted on Figure 1-5. These wetlands provide habitat for numerous waterfowl, amphibians, reptiles, and upland wildlife species. Several species of migratory birds (ducks, geese, and cranes) commonly use wetlands.

11.a.1.2 Watercourses

Badger Run and Bear Creek are both MnDNR protected waters that run through the project area. Badger Run is located in the southwestern portion of the project area and runs northwest along Marion Road. Bear Creek is located in the central portion of the project area and runs west along 20th Street SE. There are approximately 243 acres of watercourses and associated floodway within the project area. Portions of both creek corridors are heavily wooded and provide habitat for upland wildlife and migratory birds. Migratory birds, amphibians, reptiles, and waterfowl are common types of species found along creeks. The *Stormwater Plan* included the information on Bear Creek and Badger Run, that information is summarized below.

11.a.1.2.1 Bear Creek

Rochester's *Stormwater Plan* recommended protecting, preserving, and enhancing most of the natural vegetation and wildlife present along Bear Creek. Primary and secondary boundaries were delineated to define appropriate levels of protection. Areas identified within the primary boundary are considered critical to flood control, water quality and ecosystem preservation, consisting of the areas adjacent to the stream where land uses and human activities directly impact the biological and morphological characteristics of a stream. The primary corridor consists of designated floodplain and adjacent steep slopes. Areas identified within the secondary boundary directly contribute to the support and preservation of the primary corridor, including forest and wetland areas adjacent to major streams and other valuable natural areas.

In addition to the main stem of Bear Creek, the Bear Creek Corridor also includes Badger Run. The Bear Creek Corridor was subdivided into three segments to facilitate description. These segments are: Bear Creek-Upper Reach, Badger Run and Bear Creek-Lower Reach. Bear Creek-Upper Reach extends from County Road, downstream to Marion Road. Badger Run extends from County Road 11, downstream to the 30th Avenue Bridge between Pinewood Road and Marion Road. The Lower Reach includes Bear Creek downstream from Marion Road and Badger Run, downstream from 30th Avenue Bridge to Highway 14.

11.a.1.2.2 Upper Reach of Bear Creek

The Upper Reach of Bear Creek meanders through a narrow forested floodplain. Adjacent to the floodplain, upland forest and agriculture land uses are dominant. The Bear Creek channel is generally approximately 30 feet wide and less than one-foot deep. In many places, severely eroded stream banks are scoured by the water current and slump, re-depositing fine sediments into Bear Creek. Just downstream from 50th Avenue (CSAH 11), an unnamed tributary joins Bear Creek from the north. This tributary contains substantial flow and is approximately 15 feet wide and six-inches deep. A narrow strip

of floodplain forest runs along this tributary for much of its length, which connects with the Bear Creek floodplain forest.

Natural Communities

The original vegetation of the Upper Reach of Bear Creek consisted mostly of forest and woodland natural communities. Near Bear Creek, this consisted of floodplain and lowland hardwood forest. On uplands adjacent to the lowland area along the creek, vegetation consisted of oak forest, oak woodland-brushland, and oak savannas. Scattered patches of prairie were present on ridge tops above the creek valley.

Today lowland hardwood forest, floodplain forest, and oak woodland-brushland are the dominant natural communities in the upper reach of the Bear Creek corridor. The quality of lowland hardwood forest in the corridor is generally much higher than in other portions of the City. Along the upper reach of Bear Creek, groundwater seepage seems to be the primary source of water, not inundation from the nearby creek. Dominant tree species include green ash, eastern cottonwood, burr oak, American elm, silver maple, and boxelder. Native shrubs such as hazel, speckled elder, and chokeberry were present in this lowland hardwood forest.

Upland forest communities in the upper reach of the corridor generally consist of mesic oak forest on north- and east-facing slopes and oak woodland-brushland on dry, well-drained areas adjacent to the creek floodplain. Red oak, burr oak, basswood, black cherry, and green ash are common tree species within mesic oak forest natural communities. Burr oak, pin oak, black oak, trembling aspen, and black cherry are the dominant tree species in oak woodland-brushland areas. In general, the shrub layer is dominated by such species as buckthorn, prickly gooseberry, black current, prickly ash, and raspberry. The overall quality as measured by species diversity and impacts from human disturbances (logging and grazing) is moderate to high in these upland forested natural communities.

Several significant wetlands occur in this reach. One of the better quality wetlands is bisected by 50th Avenue (CSAH 11), just north of the creek. This wetland is a seepage meadow with old creek oxbows bisecting it in several places. Small areas of emergent marsh occur in these oxbows. The wet meadow seepage areas are dominated by sedges and wool grass; emergent areas by river bulrush, cattail, wild mint, and reed canary grass. Although exotic species such as reed canary grass are present, and grazing continues to occur in this wetland, the overall quality of this wetland is good.

Wildlife

Due to the high quality and good diversity of natural communities and the connectivity of these natural communities to Bear Creek, wildlife habitat values in the upper reach are high.

Fisheries

The upper reach of Bear Creek is classified by the MnDNR as a rough fish-forge fishery. Some of the more common fish include white sucker, creek chub, fathead minnow, black redhorse, and golden redhorse. The MnDNR maintained a marginal fishery for brown, rainbow, and brook trout through stocking up until 1975. Stocking was discontinued after it was determined that: 1) suitable habitat for trout in Bear Creek is scarce; and 2) there is low species productivity due to fine sand

substrates and warm water temperatures. In some portions of Bear Creek where springs provide cold water sources, the potential for future trout establishment exists. Re-establishment of trout in Bear Creek, however, does not appear to be a high MnDNR priority.

11.a.1.2.3 Lower Reach of Bear Creek

The lower reach of Bear Creek lies within a level floodplain and is a sizable stream, averaging 37 feet wide and more than one-foot deep. Within this reach, Willow Creek and Badger Run discharge into Bear Creek. Floodplain forest runs continuously along Bear Creek and its tributaries in this reach. Because most of this area lies within the floodplain, land uses are mostly limited to agricultural fields and City parkland.

Natural Communities

The original vegetation of the lower reach of the Bear Creek Corridor consisted of oak savanna, oak woodland-brushland, and oak forest. Oak forest occurred in areas protected from fires (such as areas adjacent to the creek). Oak savanna occurred on well-drained alluvial soils where fires and activities of large grazing animals, such as bison, prevented the establishment of woody vegetation. Some parts of the lower reach of the Bear Creek Corridor still superficially resemble oak savanna. These areas contain the original burr oak trees, but have largely lost their native assemblages of grasses and forbs. The dominant natural community along Bear Creek today is floodplain forest. Dominant tree species include boxelder, silver maple, green ash, American elm, and willow. The shrub layer is generally open and is dominated by buckthorn, an exotic shrub. Where the elevation is somewhat higher and flooding is not frequent, dry oak forest dominated by burr oak, white oak, pin oak, black oak, black cherry, and trembling aspen is found. These areas have probably succeeded from a more open oak woodland-brushland due to the lack of fires. Forested natural communities in the lower reach of Bear Creek contain large numbers of exotic and/or weedy species such as boxelder and buckthorn and, therefore, are low to moderate quality.

In addition for forested natural communities, wet meadows, and scrub shrub wetlands are scattered throughout this reach in depressional areas. These wetlands are generally of low to moderate quality for reasons stated above and are dominated by reed canary grass, red osier dogwood, willows, and buckthorn.

Wildlife

The lower reach of Bear Creek provides significant wildlife habitat in spite of the generally low quality of natural communities. The forested communities typically contain many large trees with numerous cavities. Many of these dead trees, referred to as snags, are still standing. These snags provide habitat for many species of wildlife that use tree cavities for nesting and as a food source, typically due to insects occupying the trees. In addition to the numerous snag trees, large white and burr oaks provide food for a host of wildlife species. The creek contains food items such as fish, crayfish, and other aquatic invertebrates used as food by raccoon, mink, and herons. Perhaps the most important habitat factor is its connectivity, this area serves as a link among other areas of significant wildlife habitat including: Willow Creek, Badger Run, and the Upper Reach of Bear Creek, linking all of these corridors to allow for the movement of birds, mammals, reptiles, and amphibians.

Fisheries

The same comments for the upper reach of Bear Creek apply to the lower reach of Bear Creek.

11.a.1.2.4 Badger Run

The upper portion of Badger Run, just downstream from 50th Avenue (CSAH 11), flows through or adjacent to, a series of wet meadow/sedge meadow wetlands. The wetlands and the slightly higher land adjacent to them are presently used for pasture. The lower portion of Badger Run flows through pastured areas of hobby farms and residential areas. Much of the riparian fringe in this reach of Badger Run is affected by debris and fill placed in the floodplain. Runoff from residential septic systems (outlet pipes from drain fields) and livestock is evident in places along this reach. The habitat value of this section Badger Run could improve if some of these negative aspects were improved.

Natural Communities

At the time of European settlement, the vegetation of Badger Run was dominated by oak savanna and oak woodland-brushland. Along the creek itself, wet prairie and wet meadow wetlands would have also been present.

The upper portion of Badger Run just below 50th Avenue (CSAH 11) contains numerous wet meadow wetlands. Because of drainage and cattle grazing, most of these wetlands are degraded and dominated by reed canary grass with scattered pockets of hummock sedge and blue vervain. The surrounding pastures are grazed heavily and generally contain a mixture of brome and blue grass. The lower portion of Badger Run (downstream from 30th Avenue SE) is characterized by a narrow riparian fringe of low quality floodplain forest dominated by boxelder and eastern cottonwood or shrub swamp dominated by willow, dogwood, and reed canary grass. Along Pinewood Road, several tracks of oak forest and oak woodland-brushland are present. The more moist, mesic forested natural communities occur on north facing slopes and are dominated by burr oak, basswood, red oak, white oak, and American elm.

Wildlife

Wildlife quality habitat is moderate within Badger Run. The quality of wildlife habitat is reduced due to the poor overall quality of natural communities in this corridor and the lack of connection between Badger Run and upland wildlife habitat.

Fisheries

No fishery surveys have been conducted in Badger Run. It is likely that many of the fish species present in the lower portions of Bear Creek are present in, or would migrate into, Badger Run. Beaver dams and low water levels may act as a barrier to upstream fish migration during some years.

11.a.1.3 Lakes

No lakes are present within the project area.

11.a.1.4 Woodland Areas

Woodland areas comprise approximately 30 percent of the total project area, accounting for 1,496 acres. Several forest stands are found throughout the project area while others align the Badger Run and Bear Creek corridors. Similar to agricultural/open lands, the woodlands provide habitat areas to numerous wildlife species described above.

Olmsted County, Committee on Urban Design and Environment (CUDE), Minnesota County Biological Survey (MCBS), and Minnesota Department of Natural Resources (MnDNR) information was used to classify and map woodland areas, grasslands, and shrublands. The forest cover classifications within the project area are depicted on Figure 1-4. The majority of the woodlands were classified as lowland hardwood and oak forest.

11.a.1.5 Grassland and Shrubland

Olmsted County, CUDE, MCBS, and MnDNR information was used to classify and map woodland areas, grasslands, and shrublands. Grassland and shrubland comprise approximately 20 percent of the total project area, accounting for 960 acres. Grassland and shrubland within the project area are depicted in Figure 1-4. Similar to agricultural/open lands, the grassland and shrubland provide habitat areas to numerous wildlife species described above. Table 2-2 provides information on native grassland acreages.

11.a.1.6 Agricultural/Open Land

Agricultural/open land comprises a large portion of the total area, accounting for 2,620 acres, approximately 60 percent of the project area. The agricultural/open land is defined as agricultural land, undeveloped land, and land that was not classified during the biological inventory of the area and is not differentiated from cropland. Some overlapping of other land types already described are included in this area.

The agricultural and open land areas provide nesting habitat, cover, and food for wildlife. There are numerous small and medium sized mammals that utilize these lands including white-tailed deer, raccoons, red and gray fox, woodchuck, squirrel, and other small mammals. Song and game birds may also be present throughout the project area and include a variety of edge, open, and woodland species.

11.a.1.7 Current Development

Table 2-1 presents current development acreages. There are currently 893 acres of low density residential, 14 acres of commercial, 25 acres of industrial, and 377 acres of transportation and associated right-of-way. These uses comprise 1,309 acres of current development, which is approximately 30 percent of the project area.

11.a.1.8 Potential Habitat Impacts

The conversion of open land, agricultural land, woodland, grassland, shrubland, and wetlands to urban types of development will disturb the habitat and feeding areas, and affect current wildlife species. Increased runoff volumes during construction and from developed areas will drain to wetlands and creeks in the area (see the response to Questions 16 and 17). The contiguous habitat corridor associated with

Bear Creek and Badger Run may become more fragmented by development in the area. Presently, development and infrastructure design plans are largely unknown for properties within the project area. Due to the unknown nature of future development within the project area, the extent of impacts on wildlife and natural resources is not fully known. Alternative site design to help to maintain areas for natural habitat are supported by the subdivision design policies as identified in the *City Plan* and *City of Rochester Code of Ordinances* help to maintain areas for natural habitat.

- b. Are any state-listed (endangered, threatened or special concern) species, rare plant communities or other sensitive ecological resources such as native prairie habitat, colonial waterbird nesting colonies or regionally rare plant communities on or near the site?**
x Yes No

If yes, describe the resource and how it would be affected by the project. Indicate if a site survey of the resources has been conducted and describe the results. If the MnDNR Natural Heritage and Nongame Research program has been contacted give the correspondence reference number See below. Describe measures to minimize or avoid adverse impacts.

AUAR Guidance: b. For an AUAR, prior consultation with the MnDNR Natural Heritage program for information about reports of rare plant and animal species in the vicinity is required. If such consultation indicates the need, an on-site habitat survey for rare species in the appropriate portions of the AUAR area is required. Areas of on-site surveys should be depicted on a map, as should any “protection zones” established as a result.

11.b.1 Natural Heritage Program

The MnDNR Natural Heritage Program (NHP), data was obtained from the MnDNR and is included in Figure 1-4. The MnDNR was contacted regarding providing a coordination letter (Sarah Hoffman personal communication). Since the City purchased the electronic database containing NHP data from the MnDNR, a coordination letter was not required NHP review of the AUAR utilizing this database information will be conducted.

There are two natural heritage recorded wildlife species that occur within the project area, the Blanding’s turtle (state listed threatened) and the Blue racer snake (state listed special concern). There are no state listed endangered species recorded for the project area.

11.b.1.1 Blanding’s Turtle

The Blanding’s turtle (*Emydoidea blandingii*) is a state-listed threatened species associated with sandy soils and a variety of wetland types. A species is ranked as threatened, if the species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Threatened species are protected under the Federal Endangered Species Preservation Act of 1973, as amended in 1978, 1982, and 1988; Minnesota Statutes Chapter 84.0895; Minnesota Rules Chapter 6134; and the *County Plan*.

The preferred habitat of the Blanding’s turtle includes calm, shallow water, rich, aquatic vegetation and sand uplands for nesting. Studies by Congdon *et.al.*, (1983) in Michigan and by Linck in Massachusetts have shown that nesting females may travel considerable distances (200 to 400 meters) to a nesting area,

passing enroute what appears to be suitable nesting habitat immediately adjacent to the marsh in which they reside (Coffin and Pfannmuller 1988).

Blanding's turtles need both wetland and upland habitats to complete their life cycle. The loss of wetland habitat through drainage or flooding to convert wetlands into ponds or lakes, loss of upland habitat through development or conversion to agriculture, human disturbance (including collection for pet trade, road kills during seasonal movements), and increases in predator populations (skunks, raccoons, etc.) that prey on nests and young all contribute to a decline in this species.

In long-lived species, protecting the adults is critical to any conservation strategy. A female turtle may produce as many as 500 eggs during her life. Losing many of these long-lived females, through habitat loss or direct mortality, would seriously jeopardize the ability of a population to maintain itself. One of the potential threats is mortality while crossing roadways. Roadway design and large culverts or tunnels may provide an alternative route for turtles, but requires further evaluation to refine design and effectiveness (Lang 2000). Other potential mitigation measures are described in Part III- Mitigation Plan.

11.b.1.2 Blue Racer

The Blue racer snake (*Coluber constrictor*) is a state-listed species of special concern. A species is listed as special concern if, although the species is not endangered or threatened, it is extremely uncommon in this state, or has unique or highly specific habitat requirements and deserves careful monitoring of its status. Species on the periphery of their range that are not listed as threatened may be included in this category along with those species that were once threatened or endangered, but now have increasing or protected, stable populations. Special Concern species are not protected under current regulations.

The Blue racer occupies a variety of habitats in the deciduous forest regions of Minnesota, including forested hillsides, bluff prairies, grasslands, and open woods. Woodland margins and field edges are the preferred summer habitats (Coffin and Pfannmuller.1988). Blue racer snakes live in a variety of open dry habitats such as brushy areas along the edges of deciduous woodlands, grass prairies, bluff prairies, and old fields. Because these snakes primarily hunt by sight, they avoid areas of dense vegetation. Blue racers overwinter in mammal burrows, rock crevices, gravel banks, stone walls, and abandoned wells. They may share these winter homes with other racers, Timber rattlesnakes, Rat snakes, Gopher snakes, and common Garter snakes. The destruction and loss of habitat are the greatest threat to amphibian and reptile populations and is especially critical to rare species. Pesticide accumulation, hunting, and over- collecting also pose a threat.

11.b.1.3 Other Information

Investigations conducted during the development of the *Stormwater Plan*, initiated in the mid- to late-1990s, identified NHP species associated with Bear Creek and Badger Run. Two records of Blanding's turtle and two records of Blue racer snakes were shown. One record of a Blanding's turtle is shown for the upper portion of Badger Run. The occurrence of the Blanding's turtles is possible along much of Badger Run due to the number of wetlands along the Creek.

Additionally, the black redhorse is a special concern fish species found only in a few drainage areas of southeast Minnesota. This species has been documented during fishery surveys of Bear Creek. The black redhorse has been collected from the lower reach of Bear Creek. Within the lower portions of

Badger Run, the potential occurrence of the black redhorse would be likely due to the presence of this species in Bear Creek.

A coordination letter was sent to the U.S. Fish and Wildlife Service (USFWS). The USFWS response letter (Appendix D) stated that the bald eagle (*Haliaeetus Leucocephalus*), Leedy's roseroot (*Sedum integrifolium* spp. *Leedyi*), and prairie bush clover (*Lespedeza leptostachya*) are listed as federally threatened in Minnesota and documented to occur in Olmsted County. However, there are no records indicating that these species occur within the project area. Given the location and type of activity proposed, the USFWS determined that the project is not likely to adversely affect any federally listed or proposed federally threatened or endangered species or adversely modify their critical habitat. This precludes the need for further action on this project as required under Section 7 of the Endangered Species Act of 1973.

12.0 PHYSICAL IMPACTS ON WATER RESOURCES

Will the project involve the physical or hydrologic alteration - dredging, filling, stream diversion, outfall structure, diking, and impoundment - of any surface waters such as a lake, pond, wetland, stream or drainage ditch? ☒ Yes ☐ No

If yes, identify water resource affected and give the MnDNR Protected Waters Inventory number(s) if the water resources affected are on the PWI. Describe alternatives considered and proposed mitigation measures to minimize impacts.

AUAR Guidance: The information called for on the EAW form should be supplied for any of the infrastructure associated with the AUAR development scenarios, and for any development expected to physically impact any water resources. Where it is uncertain whether water resources will be impacted depending on the exact design of future development, the AUAR should cover the possible impacts through a "worst case scenario" or else prevent impacts through the provisions of the mitigation plan.

12.1 Potential Impacts

As described, the water resources within the project area are Bear Creek, Badger Run, their related floodplains, minor tributaries, and wetlands. Bear Creek and Badger Run are both MnDNR protected waters (Figure 1-5).

It is anticipated that development in the area could impact some of the wetlands through increasing stormwater runoff. Roadway culvert and/or bridge modifications or additions may occur in the project area. Stormwater runoff is addressed under Question 17. No other impacts to surface water bodies are anticipated.

Presently, specific development and infrastructure design plans are largely undefined for properties within the project area. Further, the determination of the exact boundaries of floodplains, shorelands, and wetland delineations on properties within the area will not occur until development projects are proposed or plans for roadway extensions or modifications are submitted to the City as part of the General Development Plan (GDP) review process. Thus, specific physical impacts on water resources related to development are not known. Most underground utility installations that require stream or wetland crossing will be temporary and the resources will typically revert to their pre-construction state.

12.2 Comprehensive Wetland Management Plan

A *Comprehensive Wetland Management Plan (Wetland Plan)* was prepared for the City of Rochester in 1997 and is used as a source of technical information. The need for the *Wetland Plan* was identified during the development of the *Stormwater Plan*. At this time, the *Wetland Plan* has not been formally adopted by the City Council.

Wetlands provide a variety of functions valued by the City of Rochester. Wetlands are a part of the natural storm drainage system in Rochester and they help maintain water quality, reduce flooding and erosion, provide food and habitat for wildlife, and provide open spaces and natural landscapes that many residents enjoy. Therefore, wetlands are important physical, educational, ecological, aesthetic, recreational, and economic assets to the City.

The *Wetland Plan* prioritizes wetlands based on their functional values and by holistically managing the wetland system. The system-wide view of the *Wetland Plan* includes identification of significant wetland corridors and complexes and opportunities for banking and restoration that are not possible under the current approach to wetland regulation and management. For example, the *Wetland Plan* contemplates that degraded, poor quality wetlands could be replaced through restoration or creation of a wetland within an environmental corridor. The replacement wetland could then provide a higher level of function and value, and in some cases more contiguous acres of wetland. The *Wetland Plan* contains policies that support preservation and management of wetlands.

In some instances the *Wetland Plan* recommends protection for adjacent upland resources that provide valuable ecosystem support to a wetland. Since all wetlands do not provide equal values and functions, a wetland inventory incorporated in the *Wetland Plan* establishes priorities for protection. The *Wetland Plan* applied the following wetland management classifications (unique, natural, ecosystem support, and urban):

- The unique wetlands classification is used for wetlands that exist in a largely unaltered state and have special and unusual qualities that call for a high level of protection.
- Natural wetlands have remnant plant communities that are in a largely unaltered state and typically show little sign of impact from surrounding land usage. The vegetative communities of these wetlands are characterized by a diversity of plant species with a mixed dominance of certain species.
- Ecosystem support wetlands have usually been altered by human activities, and may be perceived as low quality systems with little value. However, inventories and assessments indicate that these areas have important values related to upland ecosystems that surround them, or they provide linkage and/or drainage to other systems.

- Urban wetland systems have been significantly altered through past disturbances. They are different from ecosystem support wetlands because they are isolated and do not provide the same ecosystem support to other systems. Many of these wetlands have had their hydrology altered and manipulated by agriculture or urban activities and are in an isolated setting.

The *Wetland Plan* can be used in conjunction with future development proposals as a source of technical information to:

- Provide wetland inventory, assessment, and management information.
- Improve City administration of the Wetland Conservation Act (WCA) by providing sequencing and varied replacement standards based on the functional values of the wetland and resulting management classifications.
- Enhance wildlife values of wetlands.
- Provide and enhance recreational values.
- Designate wetland mitigation banking areas and potentially identify opportunities for mitigation credits from buffer areas.
- Protect wetlands and adjacent resources that provide valuable ecosystem support.
- Protect wetlands from stormwater impacts based on their stormwater sensitivity.

12.3 Protection and Mitigation

Protection and mitigation of potential impacts to water resources include enforcement and implementation of the following:

U.S. Army Corps of Engineers Section 404 of the Clean Water Act: Establishes a program to regulate the discharge of dredged and fill material into waters of the U.S., including wetlands. Activities in waters of the U.S. that are regulated under this program include fills for development, water resource projects (such as dams and levees), infrastructure development (such as highways), and conversion of wetlands to uplands. Under Section 404 of the Clean Water Act (CWA), the U.S. Environmental Protection Agency (USEPA) and the U.S. Army Corps of Engineers (USACE) regulate the placement of fill into all waters of the U.S. Provisions of Section 404 of the CWA are implemented by the USACE with guidance and review by the USEPA. The USFWS provides technical oversight.

Minnesota Wetland Conservation Act (WCA): To retain the benefits of wetlands and reach the legislation's goal of no-net-loss of wetlands, WCA requires anyone proposing to drain or fill a wetland to: 1) try to avoid disturbing the wetland; 2) to minimize any impact on the wetland; and, 3) to replace any lost wetland acres, functions, and values. Certain wetland activities are exempt from WCA, allowing projects with minimal impact or projects located on land where certain pre-established land uses are present to proceed without regulation.

Stormwater Management Plan: This plan, written in 1997 and revised in 1999, creates a balance between development and natural resource conservation that meets the needs of individuals, businesses, and the community. The City incorporated much of the *Stormwater Plan* language in the *City of Rochester Code of Ordinances*. Citizens, agencies, developers, and industry work together to implement the *Stormwater Plan* and to collectively manage growth by creating developments that accomplish surface water management goals, including a reduction of physical impacts by controlling stormwater runoff rates to pre-development conditions.

13.0 WATER USE

Will the project involve installation or abandonment of any water wells, connection to or changes in any public water supply or appropriation of any ground or surface water (including dewatering)?

 X Yes No

If yes, as applicable, give location and purpose of any new wells; public supply affected, changes to be made, and water quantities to be used; the source, duration, quantity and purpose of any appropriations; and unique well numbers and MnDNR appropriation permit numbers, if known. Identify any existing and new wells on the site map. If there are no wells known on site, explain methodology used to determine.

AUAR Guidance: If the area requires new water supply wells specific information about that appropriation and its potential impacts on groundwater levels should be given; if groundwater levels would be affected, any impacts resulting on other resources should be addressed.

The County Well Index (CWI) was searched and there are approximately 450 wells located within the project area. A table containing CWI wells within the project area and their unique well numbers (where known) is included Appendix E. The majority of the wells are for private domestic use. The wells range from 10 to 610 feet in depth. One well with a MnDNR Water Appropriation Permit is located within the project area:

- Permit number 690193-1 held by Rochester Public Utilities for a public water supply Well 72 in T106N, R13W, Section 9, just west of Badger Court.

The City of Rochester is currently in the process of developing a wellhead protection plan for its water supply wells. Areas that directly impact the groundwater used for domestic consumption will be considered as wellhead protection areas. Portions of the draft Drinking Water Supply Management Areas (DWSMA) associated with Wells 21, 33, and 72 are located within the project area. These public water supply wells provide water to residents of Rochester.

As water lines are extended into the project area and individual connections to the public water supply are made, it is anticipated that hundreds of wells will be abandoned. The City water quantities to be supplied to the project area will initially correlate directly with the current pumping capacities of existing water supply wells and ultimately grow to serve the anticipated development within the area. All wells that are abandoned when City water service is initiated are required to follow rules and regulations established by Minnesota Department of Health (MDH), Minnesota Statutes Chapter 103I and Minnesota Rules Chapter 4725.3850. Any wells retained for private non-domestic use will require a well maintenance permit from the ROPD, must meet water quality standards and cannot be connected to the City water system.

Interim development projects may install new private wells as long as an escrow account is established to fund future water line construction and well abandonment.

A 500,000-gallon water tower was constructed in 2001 in the Rose Harbor Area (at the east end of Harbor Heights Court SE) to serve major portions of the project area. The new water tower replaced a nearby 100,000 gallon water tower which previously served only the Rose Harbor and Marvale areas. A 12-inch water main (replacing existing smaller water mains) is being constructed from the new water tower west and south through the Rose Harbor and Marvale areas to the 20th Street SE and Marion Road area and connected to a 16" water main constructed in 2001 along 30th Avenue SE between Marion Road and Pinewood Road. The new water tower and water main upgrades will provide service (via these high pressure water mains and planned near-future pressure reducing stations at 20th Street SE and at Pinewood Road SE) to the area east of 30th Avenue SE, and areas south of Pinewood Road above an elevation of 1,090 feet.

As the easterly portions of the project area develop, additional water storage will be required. A ground storage reservoir (approximately 1,000,000 gallon capacity) is planned for the hillside across 20th Street SE from the former Boy Scout Camp (Camp Kahler). The reservoir would be connected to the main served from the pressure reducing station on 20th Street SE near Marion Road, and would serve the east and north portions of the project area through a trunk main extending east along 20th Street SE and north along 42nd Avenue SE as this area develops. Some of the lower elevation areas north of TH 14, west of 55th Avenue, and east of the Sunnydale Subdivision could also be served by this reservoir. The reservoir would also serve areas along Marion Road through a trunk main extending south from 20th Street SE along 40th Avenue SE. This main would connect at 30th Street SE and Marion Road with a planned trunk water main extending east from the planned pressure reducing station at 30th Avenue SE along Pinewood Road and 30th Street SE, thereby creating a looped main serving the entire southeast portion of the project area. The RPU anticipates that at least one additional water supply well will be needed to serve the project area if full build out occurs.

In order to provide water service to the approximately one square mile area east of 40th Avenue SE and above an elevation of 1,140 feet, a smaller water tower and/or booster station would be required.

Rochester Typical Water Consumption Information (Year-end City-wide 2001 data):

Year-end Residential Customers:	27,589 homes
Population Served (Approximate):	90,000 persons
Average Persons Per Home (Approximate):	3.25 persons/home
Year 2001 Residential Water Sales:	2,134,382,800 gallons (2.134 billion gallons)
Average Daily Customer Water Usage:	212 gallons/home/day
	65 gallons/person/day

(RPU uses a 2.25:1 peak day/average day ratio for total water sales - not just residential sales.)

Anticipated development of the area includes the installation of underground infrastructure such as sanitary sewer, water, and storm sewer lines. This infrastructure and other excavation related to development in the area may require dewatering due to shallow depth of groundwater in portions of the project area. The MnDNR regulates water appropriation and permits for dewatering will be by the appropriate party when required. The City will require contracts for public projects to investigate and

evaluate potential dewatering impacts to adjacent shallow wells with a requirement to install temporary water service if warranted by impacts.

14.0 WATER-RELATED LAND USE MANAGEMENT DISTRICT

Does any part of the project involve a shoreland zoning district, a delineated 100-year flood plain, or a state or federally designated wild or scenic river land use district? x Yes No

If yes, identify the district and discuss project compatibility with district land use restrictions.

AUAR Guidance: Such districts should be delineated on appropriate maps and the land use restrictions applicable in those districts should be described. If any variances or deviations from these restrictions within the AUAR area are envisioned, this should be discussed.

There is not a federally listed wild or scenic river in the project area. The area in and around the City of Rochester presents a distinctive mixture of stream valleys, creeks, and wetlands leading to the South Fork Zumbro River. The water-related land use management districts within the study area include the 100-year floodplain and shoreland zoning districts associated with Bear Creek, Badger Run, and their tributaries (see Figure 1-5). As the City expands further into its USAs/URAs, these waterways may be impacted by development and may be degraded by the rate and quality of urban runoff.

Protection and mitigation of potential impacts to water resources from development in these districts will be achieved by implementation of the following:

Minnesota Department of Natural Resources State Floodplain Management Act (Minnesota Statutes, Chapter 103F) promulgates minimum standards for floodplain management entitled “Statewide Standards and Criteria for Management of Flood Plain Areas of Minnesota” (Minn. Rules 6120.5000 - 6120.6200). These standards have two direct applications: 1) all local floodplain regulations adopted after June 30, 1970, must be compliant with these standards; and 2) all state agencies and local units of government must comply with Minnesota Regulations in the construction of structures, roads, bridges or other facilities located within floodplain areas delineated by local ordinance. Local floodplain regulatory programs, administered by county government, predominately for the unincorporated areas of a county, and by municipal government for the incorporated areas of a County, must be compliant with federal and state floodplain management standards. Both federal and state standards identify the 100-year floodplain as the minimum area necessary for regulation at the local level. These regulations are intended to protect new development and modifications to existing development from flood damages when locating in a flood prone area cannot be avoided.

The determination of exact boundaries of floodplains, shorelands, and wetlands on properties within the area occurs when development is proposed for property and plans are submitted to the City as part of the General Development Plan review process. These plans are subject to *Chapter 62.800 Flood Districts of the City of Rochester Code of Ordinances*.

The *Stormwater Management Plan* identifies valuable natural features in the City and its USAs. Stream corridor and wetlands inventories were completed to assess the existing features and makes recommendations to protect high value areas. The *City of Rochester Code of Ordinances* identifies stormwater management requirements that protect receiving waters.

MnDNR Shoreland Zoning, the *County Zoning Ordinance*, and the *City of Rochester Code of Ordinances* all restrict development within 1,000 feet of the ordinary high water mark of lakes and 300 feet of the ordinary high water mark of streams. As with most areas, the exact boundaries for shoreland zoning districts within the project area have not yet been determined. In general, land within 300 feet of these streams that meet the required criteria would be classified and regulated as shoreland. Exceptions to this regulation would require obtaining a conditional use permit from the appropriate agency. Individual development projects will be required to address shoreland regulations.

15.0 WATER SURFACE USE

Will the project change the number or type of watercraft on any water body? ☐ Yes ☒ No

If yes, indicate the current and projected watercraft usage and discuss any potential overcrowding or conflicts with other uses. Not applicable.

AUAR Guidance: This item need only be addressed if the AUAR area would include or adjoin recreational water bodies.

The AUAR does not include or adjoin recreational water bodies. However, Bear Creek and Badger Run are shallow streams that may be periodically used by canoers, kayakers, and swimmers/waders.

16.0 EROSION AND SEDIMENTATION

Give the acreage to be graded or excavated and the cubic yards of soil to be moved:
 acres ; cubic yards . Describe any steep slopes or highly erodible soils and identify them on the site map. Describe any erosion and sedimentation control measures to be used during and after project construction.

AUAR Guidance: The number of acres to be graded and number of cubic yards of soil to be moved need not be given; instead, a general discussion of the likely earthmoving needs for development of the area should be given, with an emphasis on unusual or problem areas. In discussing mitigation measures, both the standard requirements of the local ordinances and any special measures that would be added for AUAR purposes should be included.

Highly erodible soils comprise approximately 40 percent of the project area. Soils are considered highly erodible if they have an erodability index above eight as classified in the Olmsted County Soil Survey. The more susceptible the soil is to wind and water erosion the higher the erodability index.

Many of the highly erodible soils are found on steep slopes that are mapped in Figure 1-6. Implementation of the development scenario and the associated construction of roads and utilities may require extensive grading and landscape alteration within the project area. Erosion will likely be most severe in slope areas or areas with highly erodible soils when soils are exposed during construction. Both of these areas require strict attention to proper erosion and sediment control measures if they cannot be avoided during development. Additionally, the *City of Rochester Code of Ordinances* contains restrictions for substantial land alterations.

The City of Rochester also currently requires developers to implement erosion and sediment control measures during development. The *City of Rochester Code of Ordinances* requires new developments to prepare site grading and erosion control plans that undergo review by a City Engineer. Plans typically identify control measures such as temporary sedimentation basins, bale checks, and silt fences to be used during construction and permanent sedimentation basins for post-construction stormwater control. Other references regarding erosion and sedimentation control guidance that are often included in the grading and erosion control plans are extracted from *MPCA Best Management Practices for Protecting Water Quality in Urban Areas* and the *Board of Water and Soil Resources (BWSR) Minnesota Construction Site Erosion and Sediment Control Planning Handbook*. National Pollutant Discharge Elimination System Phase 2 regulations will be applicable to most of the development that will occur in the project area as of March 2003.

17.0 WATER QUALITY: SURFACE WATER RUNOFF

- a. Compare the quantity and quality of site runoff before and after the project. Describe permanent controls to manage or treat runoff. Describe any stormwater pollution prevention plans.**

AUAR Guidance: For an AUAR the following additional guidance should be followed in addition to that in "EAW Guidelines":

- *It is expected that an AUAR will have a detailed analysis of stormwater issues;*

17.a.1 Stormwater Plan

The City of Rochester developed a *Stormwater Plan* in 1997 and revised it in 1999, to serve as a comprehensive guide for the expansion of the City's stormwater management system in new development and redevelopment areas. The plan will also assist the City in developing a Stormwater Pollution Prevention Program to meet the forthcoming requirements of the NPDES Phase II program in March 2003.

As development occurs in the AUAR area and land is converted to urban uses, the rate and volume of surface runoff will increase due to the addition of buildings and paved areas. The *Stormwater Plan* considered effects of the increased impermeable area, and compared runoff rates and volumes using ultimate land use projections. The plan for the design of the stormwater drainage system utilizes regional ponding areas for storage, sediment and pollutant trapping, and nutrient uptake. In addition, peak flows in creeks, rivers, and natural corridors are regulated to minimize erosion and impacts to stream morphology.

As part of the *Stormwater Plan*, the City developed the following goals and policies to reduce the pollutant loads from urban runoff and to reduce the erosion and flooding potential of the City's streams and drainage systems.

17.a.1.1 Flood Protection

- Adopt stormwater management practices to provide a 100-year rainfall event level of protection.
- Establish allowable elevations for the lowest floors of buildings as follows:
 - a. Two feet above 100-year levels near ponding areas and unmapped floodplains.
 - b. One foot above 100-year levels near mapped floodplains.
 - c. One foot above the emergency overflow outlet for buildings adjacent to ponding areas.
- Regulate development and limit uses within the 100-year flood plain to those that are properly flood protected; do not have a detrimental effect on the floodway channel and flood plain storage; and are unharmed by flooding.
- Establish rainfall events as design criteria for the following:
 - a. Storm Drainage System: 100-year rainfall event.
 - b. Storm Sewer System: 10-year rainfall event.
- Upgrade existing storm sewer facilities to a 10-year level of service when practical.
- Establish and maintain overflow routes where possible to provide relief during storm conditions that exceed design conditions.
- Preserve the necessary storage capacities of protected waters and the conveyance capacity of watercourses as defined by the plan.
- Require new development of vacant land and redevelopment of existing sites to conform with the *Stormwater Plan*. As redevelopment or reconstruction of public infrastructure occurs, nonconforming areas shall, where practical, be brought into compliance.

17.a.1.2 Erosion Control

- Require erosion and sediment control practices on all construction sites.
- Use urban BMPs as described in the most recent version of the *MPCA Urban BMP Handbook* and the *City of Rochester Erosion Control Standards*.
- Establish an inspection program and enforcement procedure to control erosion on construction sites.
- Establish criteria to regulate runoff velocities and encourage natural cover to reduce erosion.
- Develop a program that encourages conservation practices to be applied to all lands in the upstream watersheds of all reservoirs to slow surface water runoff and reduce the rate of siltation.
- Minimize the impact from developing areas with highly erodible soils.

- Adopt a program for stabilizing stream banks depending on geology, setting, soils conditions and surrounding land use.

17.a.1.3 Surface Water Quality Protection

- Develop regional water quality treatment facilities with acceptable standards to remove phosphorus, heavy metals and suspended solids.
- Require the construction of water quality devices to maintain the quality of water in downstream water bodies as proposed by the *Stormwater Plan*.
- Develop maintenance standards and practices to protect surface water quality, including street sweeping and maintenance of water quality facilities.
- Protect existing wetlands and promote local wetland banking creation and enhancement.
- Maximize the use of City park land through water quality enhancement projects and demonstrations of effective water quality practices. (i.e., native vegetation along river/stream banks on City property, etc.)
- Regulate design and location of salt or sand/salt storage sites to avoid affecting water wells, lakes, rivers, streams, groundwater recharge areas, and floodprone areas. Identify feasible improvements in developed areas that will improve surface water quality.

The *Stormwater Plan* divides the City into eight major drainage districts or watersheds, and each major drainage district is further subdivided into minor drainage districts and subdistricts. As shown in Figure 2-5, the majority of the AUAR project area is located within the Bear Creek District. Small areas in the northern portion of the AUAR project area are located in the Silver Creek District and Mayo Run District, and a very small area in the southwestern AUAR project area is in the Willow Creek District. All of these districts drain into the South Fork Zumbro River within the current City limits.

All subdistricts are identified by the abbreviation of the major drainage district in which it is located, followed by the letter “a” and the number of its minor drainage district, followed by a number to differentiate it from the other subdistricts. The numbering system starts at the upstream end of the district and numerically increases downstream. For example, subdistrict bc-a1.1 is the first subdistrict of minor district a1 located in the Bear Creek District. A list of the subdistricts located within the AUAR project area and their respective areas is provided in Table 2-10.

TABLE 2-10

**AREA OF STORMWATER SUBDISTRICTS WITHIN THE PROJECT AREA
Marion Road Trunk Sanitary Sewer Project AUAR**

Area Designation	Area (Acres)	Area Designation	Area (Acres)
bc-a1.1	1073.4	bc-a1.25	112.6
bc-a1.2	907.7	bc-a1.26	99.7
bc-a1.3	906.3	bc-a2.1	8280.1
bc-a1.4	578.4	bc-a2.2	3815.1
bc-a1.5	556.3	bc-a2.3	669.2
bc-a1.6	1068.8	bc-a2.4	1553.4
bc-a1.7	99.6	bc-a2.5	3568.2
bc-a1.8	190.7	bc-a2.6	116.1
bc-a1.9	260.7	bc-a2.7a	104.4
bc-a1.10	268.1	bc-a2.7b	215.7
bc-a1.11	186.6	bc-a2.8	286.2
bc-a1.12	155.4	bc-a2.9	198.1
bc-a1.13	260.8	bc-a2.10	57.0
bc-a1.14	1833.7	bc-a2.11	194.5
bc-a1.15	152.7	bc-a2.12	86.9
bc-a1.16	220.8	bc-a2.13	58.7
bc-a1.17	571.6	bc-a2.14	123.9
bc-a1.18	86.8	bc-a2.15	148.5
bc-a1.19	91.6	bc-a2.16a	68.5
bc-a1.20	108.4	bc-a2.16b	388.7
bc-a1.21	246.3	bc-a2.17	109.1
bc-a1.22	152.2	bc-a2.18	159.6
bc-a1.23	148.7	bc-a2.19	702.0
bc-a1.24	163.5	bc-a2.20	351.4
wc-a2.9	233.3	mr-e	706.0
sc-a1.8	643.3		

Source: Bonestroo, Rosene, Anderlik and Associates and City of Rochester *Stormwater Management Plan*, 1999 and *Stormwater Management Plan: Mayo Run Watershed*, 1991.

The *Stormwater Plan* for the City proposes using five types of stormwater basins:

- Rate Control Basins: Typically contain no water during dry weather and are usually located in a naturally occurring depression.
 - Sedimentation Basins: One-cell ponds that remove larger suspended solids.
 - Nutrient Removal Basins: Two-cell ponds in which the first cell removes larger suspended solids, and the second cell maximizes detention time for nutrient removal and encourages plug flow treatment to remove fine particles. Their outlets prevent floating materials from leaving the pond. Total suspended solids removal should be greater than 90 percent, and total phosphorus removal should be greater than 65 percent.
 - Vegetation Filter Basins: Three cell ponds in which the first two cells are similar to a nutrient removal basin, but the third pond is a shallow, highly vegetated wetland capable of high nutrient and pollutant uptake characteristics.
 - Created or Restored Wetlands: Not used for stormwater detention, but for nutrient removal. They are typically located downstream from undeveloped areas or one-cell basins.
- b. Identify routes and receiving water bodies for runoff from the site; include major downstream water bodies as well as the immediate receiving waters. Estimate impact runoff on the quality of receiving waters.**

AUAR Guidance: For an AUAR the following additional guidance should be followed in addition to that in “EAW Guidelines”:

- *Map of the proposed stormwater management system and of the water bodies that will receive stormwater should be provided.*
- *The description of the stormwater systems would identify on-site and “regional” detention ponding and also indicate whether the various ponds will be new water bodies or converted existing ponds or wetlands. Where on-site ponds will be used but have not yet been designed, the discussion should indicate the design standards that will be followed.*
- *If present in or adjoining the AUAR area, the following types of water bodies must be given special analyses.*

Lakes: *within the Twin Cities metro area a nutrient budget analysis must be prepared for any “priority lake” identified by the Metropolitan Council. Outside of the metro area, lakes needing a nutrient budget analysis must be determined by consultation with the MPCA and MnDNR staffs.*

Trout streams: *if stormwater discharges will enter or affect a trout stream an evaluation of the impacts on the chemical composition and temperature regime of the stream and the consequent impacts on the trout population (and other species of concern) must be included.*

17.b.1 Stormwater Basins and Conveyance

According to the *Stormwater Plan*, 28 stormwater facilities and other structures are proposed within the AUAR project area. Figure 2-5 shows the locations of proposed stormwater basins and their associated receiving waters, and Figure 2-6 provides the preliminary layout of the future trunk storm sewer system. XP-SWMM software modeling was used to determine pond storage capacity and outflow rates. Summaries of regional water quality basin data proposed within the AUAR area are provided in Table 2-11. A summary of proposed stormwater piping is provided in Table 2-12.

As previously described, the majority of the AUAR project area lies within the Bear Creek District, a drainage area southeast of Rochester that extends to the confluence with the South Fork Zumbro River. The district has low gradient streams with wide, flat floodplains in most areas, and consists of 30,473 acres of drainage area. The *Stormwater Plan* indicates that 24 stormwater facilities and other structures are proposed within this district in the AUAR project area. Information on the proposed facilities and structures is provided in Table 2-11. Flood control structure BR-1, located east of the AUAR area, is the major reservoir (118.4 acres), and Bear Creek and Badger Run are the major streams located within the district. Information on BR-1 is also provided in Table 2-11 and it is referred to in the table as BC Reservoir. Protecting the floodplain areas for both streams is essential to maintain conveyance capacity and flood storage volumes.

The BR-1 Reservoir was constructed approximately three miles west of Eyota to control stream flows in Bear Creek from the 8,280 acres of upstream drainage. Bear Creek continues west from this structure to the confluence with Badger Run at Bear Creek Park, which is located just outside of the AUAR project area. Badger Run begins east of the unincorporated area of Marion and flows parallel to Highway 52 to Bear Creek. Historical development has occurred along both Bear Creek and Badger Run without the benefit of stormwater management planning. Further development within the USAs/URAs will require that stormwater facilities be designed to control runoff rates and treat stormwater in locations along both streams where development has not yet occurred.

A small area in the northeastern AUAR project area is in the Silver Creek District. It drains 12,260 acres to the South Fork Zumbro River through two stream channels. Silver Creek extends west from Reservoir SR-2 west of 50th Avenue (CSAH 11) to Silver Lake. Fifteen stormwater basins are proposed to serve the Silver Creek District, however regional facilities could not be designed for all subdistricts due to the gradient along many ravines. These areas must include the use of BMPs to control the discharge rates and levels of pollutants.

Another small area in the northwestern AUAR project area is in the Mayo Run District. It drains 2,200 acres into the Mayo Run Environmental Corridor and is proposed to consist of 19 regional stormwater facilities, but no major reservoirs. Several regional stormwater facilities are proposed to limit peak flows along Mayo Run. There are no regional stormwater facilities for the Willow Creek District in the project area.

TABLE 2-11

**PROPOSED STORMWATER BASINS WITHIN THE PROJECT AREA
Marion Road Trunk Sanitary Sewer Project AUAR**

Watershed Pond ID #	Normal Water Level Elevation (NWL) (ft)	Basin Surface Area at NWL (Ac.)	100-Year High Water Level (HWL) (ft)	100-Year Water Level Fluctuation (ft)	100-Year Detention Volume (Ac.-Ft)	100-Year Peak Discharge (cfs)	Water Quality Volume (Ac.-Ft)	Basin Primary High Flow Outlet
BC-P1.8	1135	1.5	1140.4	5.4	5.2	122.8	1.3	42" RCP
BC-P1.9a	1170	0.5	1174.7	4.7	3.7	89.3	1.7	36" RCP
BC-P1.9b	1170	0.6	1174.5	4.5	3.5	91.2	1.9	42" RCP
BC-P1.9	1085	7.4	1089.9	4.9	37.4	257.2	N.A.	Control Struct.
BC-P1.11	1070	5	1074.3	4.3	21.6	37.4	15.5	27" RCP
BC-P1.12	1085	3.8	1089.9	4.9	20.4	40.5	4.5	30" RCP
BC-P1.15	1040	3.5	1044.8	4.8	18.5	61.4	4.4	36" RCP
BC-P1.18	1052	2	1056.8	4.8	10.9	17.9	2.4	18" RCP
BC-P1.21	1033	4.8	1037.6	4.6	25.8	105.4	8.1	36" Culvert
BC-P1.23	1055	2.5	1059.0	4.0	10.9	58.2	4.3	30" RCP
30 th Ave. SE	1017.7	N.A.	1024.9	7.2	N.A.	3311.8	N.A.	(3) 11' Equiv. Arch
BC-P1.24	1013	3.8	1017.5	4.5	18.6	84.5	5.7	36" RCP
BC Reservoir	1155.5	115	1167.2	11.7	1801.8	409.6	N.A.	SCS Structure
A2.4-Cty Rd 11	1043	0.5	1050.1	7.1	N.A.	2235.3	N.A.	Bridge
A2.5-Cty Rd 11	1048	0.2	1054.1	6.1	N.A.	1237.7	N.A.	Arch Culverts
BC-P2.6	1060	3.6	1064.3	4.3	17.0	15.3	3.3	18" RCP
BC-P2.7a	1088	3.3	1092.2	4.2	15.2	13.8	3.2	18" RCP
BC-P2.7b	1047	4.7	1051.5	4.5	22.8	122.4	6.1	42" RCP
BC-P2.8a	1105	0.5	1110.2	5.2	5.6	85.6	0.0	36" RCP
BC-P2.8b	1047	2.8	1051.9	4.9	14.8	135.2	6.7	42" RCP
BC-P2.12	1033	4.4	1037.7	4.7	22.5	14.9	4.2	18" RCP

TABLE 2-11

**PROPOSED STORMWATER BASINS WITHIN THE PROJECT AREA
Marion Road Trunk Sanitary Sewer Project AUAR**

Watershed Pond ID #	Normal Water Level Elevation (NWL) (ft)	Basin Surface Area at NWL (Ac.)	100-Year High Water Level (HWL) (ft)	100-Year Water Level Fluctuation (ft)	100-Year Detention Volume (Ac.-Ft)	100-Year Peak Discharge (cfs)	Water Quality Volume (Ac.-Ft)	Basin Primary High Flow Outlet
A2.14- Marion Rd	1016	N.A.	1027.5	11.5	N.A.	3517.9	N.A.	Bridge
BC-P2.15	1031	4.0	1035.1	4.1	17.7	37.2	3.9	24" RCP
BC-P2.16a	1090	1.9	1094.9	4.9	10.7	13.7	1.9	18" RCP
BC-P2.16b	1011	7.2	1015.6	4.6	35.9	195.2	11.1	48" RCP
SC-P1.8a	1062	2.2	1067.0	5.0	13.2	83.3	4.4	36" RCP
Ep-1	1130	2.0	1136.0	6.0	10.3	3.4	3.0	
Ep-2	1123	2.1	1128.0	5.0	11.9	3.6	2.5	

Source: Bonestroo, Rosene, Anderlik and Associates and City of Rochester *Stormwater Management Plan*, 1999 and *Stormwater Management Plan: Mayo Run Watershed*, 1991.

1. BC-P1.8 refers to the proposed pond in the eighth subdistrict of minor district a1 located in the Bear Creek District.
2. RCP is the acronym for Reinforced Concrete Pipe.
3. Equiv. Arch refers to an arched concrete pipe used to convey stormwater.
4. SCS is the acronym for Soil Conservation Service and is now referred to as the National Resource Conservation Service (NRCS).
5. A2.4-Cty Rd 11 refers to the fourth subdistrict of minor district a2 located in the Bear Creek District. This structure is located near County Road 11.
6. SC-P1.8a refers to the proposed pond in the eighth subdistrict of minor district a1 located in the Silver Creek District.
7. EP-1 refers to the proposed pond in the eastern subdistrict of the Mayo Run District.

TABLE 2-12

**PROPOSED STORMWATER PIPING WITHIN THE PROJECT AREA
Marion Road Trunk Sanitary Sewer Project AUAR**

Pipe Designation		Drainage Area (Ac)	Design Capacity (CFS)	Length (Feet)	Diameter (in)
Flow From	Flow To				
BC1.1	BC1.2	100	101.0	400	42
BC1.3	BC1.4	192	176.4	700	48
BC1.5	BC1.6	291	319.2	400	60
BC1.7	BC1.8	50	82.1	1300	36
BC1.9	BC1.10	70	82.1	800	36
BC1.10	BC1.13	108	101.0	400	42
BC1.11	BC1.13	36	67.0	800	36
BC1.12	BC1.13	33	50.5	800	30
BC1.13	BC-P1.10	224	197.0	1300	54
BC1.15	BC1.16	37	58.3	1200	30
BC1.16	BC1.17	72	94.8	2100	36
BC1.17	BC-P1.11	522	610.0	500	Channel
BC1.18	BC-P1.11	39	58.3	600	30
BC-P1.11	BC1.19	704	379.2	600	54
BC1.20	BC1.21	33	50.5	800	30
BC1.21	BC1.22	56	82.1	1200	36
BC1.22	BC-P1.12	99	142.8	700	42
BC-P1.12	BC1.19	160	49.3	500	30
BC1.19	BC1.23	864	430.0	900	Channel
BC1.24	BC-P1.15	32	50.5	900	30
BC1.25	BC1.26	46	67.0	600	36
BC1.26	BC-P1.15	86	123.7	900	42
BC-P1.15	BC-P1.15b	156	123.7	400	42
BC1.28	BC1.30	44	67.0	600	36
BC1.29	BC1.30	45	67.0	300	36
BC1.30	BC1.31	111	123.7	1200	42
BC1.31	BC1.32	152	176.4	700	48
BC1.32	BC-P1.21	193	260.7	200	60
BC-P1.21	Badger Run	241	70.7	200	36
BC1.34	BC-P1.18	38	58.3	800	30
BC1.35	BC1.36	32	61.2	1300	30
BC1.36	BC1.38	70	94.8	700	36
BC1.37	BC1.38	33	65.2	1300	30
BC1.38	BC-P1.23	131	164.2	600	48
BC-P1.23	BC-P1.23b	149	90.0	200	36
BC-P1.23b	Badger Run	150	60.9	200	30
BC1.40	BC1.42	38	65.2	1500	30

TABLE 2-12

**PROPOSED STORMWATER PIPING WITHIN THE PROJECT AREA
Marion Road Trunk Sanitary Sewer Project AUAR**

Pipe Designation		Drainage Area (Ac)	Design Capacity (CFS)	Length (Feet)	Diameter (in)
Flow From	Flow To				
BC1.41	BC1.42	36	64.1	600	30
BC1.42	BC1.43	60	101.0	700	42
BC1.43	BC1.44	106	209.0	600	54
BC1.44	BC-P1.24	115	270.0	900	Channel
BC1.46	BC-P1.25	96	241.0	500	54
BC2.1	BC2.2	50	71.5	600	30
BC2.2	BC2.3	108	149.8	700	42
BC2.3	BC2.4	142	203.7	1000	48
BC2.4	BC-P2.8	191	241.3	1500	54
BC2.5	BC-P2.8	37	59.9	800	36
BC-P2.8	Bear Creek	301	175.6	200	48
BC2.7	BC-P2.7a	38	58.3	1100	30
BC-P2.7a	BC2.9	105	16.0	1500	18
BC2.8	BC-P2.6	44	82.1	1300	36
BC-P2.6	BC2.9	116	15.3	900	18
BC2.9	BC2.11	78	144.0	800	48
BC2.10	BC2.11	30	50.5	600	30
BC2.11	BC-P2.7	376	260.7	500	60
BC-P2.7	Bear Creek	437	175.4	300	42
BC1.12	BC1.13	40	59.9	600	36
BC1.13	BC-P2.12	62	90.3	800	42
BC1.14	BC1.15	38	58.3	800	30
BC1.15	BC-P2.12	47	67.0	300	36
BC-P2.12	Bear Creek	140	94.1	600	18
BC2.18	BC2.19	48	71.4	300	42
BC2.19	BC2.20	69	101.8	700	48
BC2.20	BC-P2.15	99	139.3	600	54
BC-P2.15	Bear Creek	138	94	200	18
BC-P2.16a	BC2.22	74	13.7	500	12
BC2.22	BC2.23	110	19.6	1200	21
BC2.23	BC2.24	150	27.9	1300	24
BC2.24	BC2.25	206	241.3	1000	54
BC2.25	BC-P2.16	325	319.3	400	60
BC-P2.16	Bear Creek	392	195.2	200	48

Source: Bonestroo, Rosene, Anderlik and Associates and City of Rochester *Stormwater Management Plan*, 1999.

17.b.2 Special Concerns

A summary of the special concerns within the AUAR project area for the Bear Creek, Silver Creek, and Mayo Run Districts is given below. There are no special concerns for the Willow Creek District within the AUAR project area.

- Subdistricts BC-A1.7, BC-A1.8 and BC-A1.9 all drain to the existing box culvert at 55th Street SE (total drainage area of 507 acres). The proposed basin BC-P1.9 is identified to reduce the peak flow rate from this area through construction of a control structure and excavation to provide detention volume for a 100-year discharge rate of 246 cfs. The final design of the basin must include an analysis of the current and ultimate downstream capacity through the residential subdivision north of Marion Road. The channel currently flows through subdivided lots that have not been developed (existing homes are greater than 10 years old). If future development requires this channel to be diverted, flows from BC-P1.9 should be channeled to BC-P1.11. A detailed hydraulic analysis will be required for BC-P1.11 to consider increased volumes and required outlet capacity. BC-P1.8 is an existing basin within BC-A1.8 and currently does not have a stabilized outlet.
- BC-P1.11 is located within an existing gravel mining site. Runoff from subdistricts BC-A1.7, BC-A1.8, and BC-A1.9 must be directed to this basin by constructing a channel between the existing crossing at 50th Avenue SE and the pond normal water level. Future gravel mining in this area should be oriented toward developing this basin and channel excavation.
- BC-P1.15 is a two-cell pond split by Marion Road. The pond was designed to operate as one pond under large storm events. The second cell west of Marion Road acts as the control for water levels in both cells. This will require an equalizer pipe between the two ponds. A 48-inch pipe was assumed in the design. Depending on specific future development of the area, both cells may be shifted to either side of Marion Road if site conditions are adequate.
- BC-P1.21 is located between Marion Road and Badger Run. Final basin design must insure that the tail water effect from the 100-year high water level of Badger Run does not cause this basin to exceed the 100-year high water level.
- BC-P1.23 is indicated as a two-cell pond split by the crossing of 30th Avenue SE due to existing land constraints in the lower portion of the drainage area. Optimum final pond design would shift both cells to one side of the road if sufficient land can be acquired at the time of construction. The stream bank and floodplain along the south side of Badger Run in this area would benefit greatly from the combined effects of stream bank restoration and pond construction.
- BC-P2.8 has been located north of 19th Street SE based on the current level of development in the area. An alternative location for this basin, depending on future development, would shift BC-P2.8 west to the north of 20th Street SE. The trunk storm sewer would then be realigned to direct flows from 19th Street to this basin.

- BC-P2.15 was designed to control runoff from subdistrict BC-A2.15. Future development north of 20th Street SE should include grading the ditch along 20th Street and channel construction to direct flows to this basin. This basin was located based on existing forested areas south of 20th Street. Future reconstruction of 20th Street should include the construction of a trunk storm sewer.
- Subdistricts BC-A2.16 A and B include 405 acres of land zoned for low-density residential and commercial development. Approximately 60 percent of the area in the lower portion of the watershed has been developed. A stormwater facility to control runoff rates has not been constructed at this time. Basin BC-P2.16a is proposed to decrease the discharge rate to downstream storm sewers to prevent surcharging. Future development within subdistrict BC2.16a that cannot be directed to this basin must insure that the downstream storm sewers have adequate capacities.
- Subdistrict SC-A1.8 contains a high-quality wetland complex located within the State Wildlife Refuge. A regional stormwater facility was not designed north of TH 14 in this area to receive runoff. Development within this area must include on-site stormwater basins to limit peak discharge rates and provide water quality wet volume for runoff from a 1.8 inch, 6-hour storm event. SC-P1.8 was designed as a two-cell pond to treat runoff from future development south of TH 14.
- Runoff from approximately 2,000 acres of Mayo Run must pass under 13th Avenue through the existing 4-foot × 10-foot box culvert.

18.0 WATER QUALITY: WASTEWATERS

- a. Describe sources, composition and quantities of all sanitary, municipal and industrial wastewater produced or treated at the site.**
- b. Describe waste treatment methods or pollution prevention efforts and give estimates of composition after treatment. Identify receiving waters, including major downstream water bodies, and estimate the discharge impact on the quality of receiving waters. If the project involves on-site sewage systems, discuss the suitability of site conditions for such systems.**
- c. If wastes will be discharged into a publicly owned treatment facility, identify the facility, describe any pretreatment provisions and discuss the facility's ability to handle the volume and composition of wastes, identifying any improvements necessary.**
- d. If the project requires disposal of liquid animal manure, describe disposal technique and location and discuss capacity to handle the volume and composition of manure. Identify any improvements necessary. Describe any required setbacks for land disposal systems.**

AUAR Guidance: Observe the following points of guidance in an AUAR:

- *Only domestic wastewater should be considered in an AUAR—industrial wastewater would be coming from industrial uses that are excluded from review through an AUAR process;*
- *Wastewater flows should be estimated by land use subareas of the AUAR area; the basis of flow estimates should be explained;*
- *The major sewer system features should be shown on a map and the expected flows should be identified;*
- *If not explained under item 6, the expected staging of the sewer system construction should be described;*
- *The relationship of the sewer system extension to the RGU's comprehensive sewer plan and (for metro area AUARs) to Metropolitan Council regional systems plans, including MUSA expansions, should be discussed. For non-metro area AUARs, the AUAR must discuss the capacity of the RGU's wastewater treatment system compared to the flows from the AUAR area; any necessary improvements should be described;*
- *If on-site systems will serve part of the AUAR the guidance in "EAW Guidelines" (pages 16-17) should be followed.*

18.1 Wastewater Collection and Treatment

Approximately 970 existing individual septic systems serve homes or businesses within the AUAR study area. In some cases, the septic systems are aging, causing the threat of surface and/or groundwater contamination, and owners cannot replace the deficient septic systems due to size or dimensional constraints of the lots. As a result, the City has begun to implement a WQPP for a sanitary sewage collection system to serve the area. Existing topography indicates that the area can be effectively served by gravity sewer extensions from the City's existing sanitary sewer trunk main system that conveys wastewater to the Rochester Water Reclamation Plant (RWRP).

The AUAR study area will generate typical domestic wastewater. No wastewater pre-treatment methods or pollution prevention methods will be used within the project study area. All wastewater collected will be conveyed to the RWRP. Effluent from the RWRP is discharged to the South Fork of the Zumbro River.

Future wastewater production rates were determined for the study area based on the hypothetical development scenario. The results were used in the design of the trunk and sub-trunk sewer system and are summarized in Table 2-13.

TABLE 2-13

**FUTURE AVERAGE AND PEAK FLOWS FOR TRUNK SEWER SYSTEM
Marion Road Trunk Sanitary Sewer Project AUAR**

Trunk or Sub-Trunk Location	Tributary Area (acres)	Total Average Flow (MGD)*	Total Peak Flow with Inflow (MGD)
20 th Street Sub-Trunk at Marion Road	2834	1.22	4.44
Badger Run Sub-Trunk at Marion Road	2799	1.20	4.39
Marion Road Trunk at Willow Creek Trunk	5633	2.42	8.83
Bear Creek Sub Trunk	Undetermined, currently in planning stage	Undetermined, currently in planning stage	Undetermined, currently in planning stage

Source: SEH, Inc. and the City of Rochester.

* MGD = million gallons per day.

Sanitary sewer flows were estimated by SEH, Inc. using wastewater production rates, infiltration rates, inflow coefficients, area reduction factors, and peaking factors determined in Volume No. 1 of the *1996 Wastewater Master Plan*. A summary of these assumptions is as follows:

- Low Density Residential Production Rate of 335 gallons per day (gpd)/acre.
- Industrial Production Rate of 1500 gpd/acre.
- Infiltration Rate of 250 gpd/acre.
- Inflow Coefficient of 0.0035.
- Area Reduction Factor of 0.6 for Platted and 0.48 for Unplatted.
- Peaking Factor (without Inflow) of 1.3.

The City has plans to install trunk and sub-trunk sanitary sewers that will ultimately provide sewer service to the AUAR project area. Figure 1-3 shows the locations of the existing and proposed trunk and sub-trunk sanitary sewers and the sewer service areas they will serve. This series of sewers will convey wastewater generated in the project area through the Rochester sewer system to the RWRP. The planned installation year and location of trunk and sub-trunk sewers are as follows:

- Marion Road Trunk Sewer (installed in 2000): Connects to the Willow Creek Trunk Sewer at the southwest corner of McQuillan Field. It then extends along the south line of McQuillan Field to Marion Rd and southeast along Marion Rd from 30th Ave SE to 22nd St SE.
- 20th Street Sub-Trunk Sewer (installed in 2001): Connects to the Marion Road Trunk Sewer near the intersection of 20th St SE and Marion Rd and extends east along 20th St SE to 37th Ave SE.

- Badger Run Sub-Trunk Sewer (to be installed in 2002): Will connect to the Marion Road Trunk Sewer near the intersection of 30th Ave SE and 22nd St SE. It then will extend south along 30th Ave SE to the north side of Badger Run. From here, the sewer will extend east/southeast along the north side of Badger Run to 32nd St.
- Bear Creek Sub-Trunk Sewer (to be installed in 2002 to 2003): Will connect to the end of the Phase I 20th Street project at approximately 37th Ave SE and will extend to 50th Ave SE. A future project may extend this subtrunk north along 50th Ave SE to TH 14.

Local service connections to the trunk and sub-trunk system will only be allowed for homes and businesses within the AUAR study area if an annexation agreement is signed, and if it is technically and economically feasible. The City Council adopted a policy in 1992 whereby the City does not require any existing home or business owner to connect to City sewer when it is installed to serve a particular subdivision, as long as their private septic system is in good operating condition. In subdivisions with available City sewer and/or water services, connection is required when the respective private systems fail. Transitions from septic systems to City sewer in the project area will take many years. Additionally, new interim development is allowed to proceed with septic systems until sewer service becomes available.

As previously stated, the primary goal of the WQPP is to reduce the threat of surface and/or groundwater contamination posed by aging or failing septic systems in the project area by providing a sanitary sewage collection system to serve the area. The RWRP has the capacity to treat wastewater coming from the AUAR project area. A consistent history of certain types of effluent permit violations could indicate that a wastewater treatment plant would have difficulty effectively treating additional wastewater. Effluent permit violations for the RWRP were reviewed and only a limited number of incidental and unrelated effluent permit violations have occurred at the RWRP over time (Table 2-14). These violations are not persistent and are not related to the hydraulic or organic loading capacity of the RWRP to treat wastewater coming from the AUAR area.

A Wastewater Treatment Master Plan, completed by the City of Rochester in 1996, indicated that the RWRP had sufficient capacity available to serve wastewater flows generated in the study area through 2008. A RWRP expansion and improvements to the existing sanitary sewer collection system may be required after 2008 as wastewater flows increase as a result of development in the project area as well as growth in other USAs/URAs. The City intends to begin facility planning later this year for future expansion of the RWRP.

TABLE 2-14
HISTORY OF EFFLUENT PERMIT VIOLATIONS
(From 1990 Through January 2002)
Marion Road Trunk Sanitary Sewer Project AUAR

MONTH	PARAMETER	MONTHLY VIOLATION	NUMBER OF WEEKLY VIOLATIONS
May 1990	Phosphorus	1	
	Suspended Solids		1
Dec. 1990	Ammonia Nitrogen		1
Jan. 1991	Ammonia Nitrogen	1	4
	Phosphorus	1	
Feb. 1991	Phosphorus	1	
Mar. 1991	Ammonia Nitrogen		1
Apr. 1991	Ammonia Nitrogen		2
	Phosphorus	1	
Jan. 1994	Ammonia Nitrogen		1
Oct. 1995	Chlorine	1 Daily	
Dec. 1996	Ammonia Nitrogen		2
May 1997	Ammonia Nitrogen	1	2
Sep. 1999	Suspended Solids	1	1
Total		8	15

18.2 Staging

See Section 6.9 of this document.

19.0 GEOLOGIC HAZARDS AND SOIL CONDITIONS

- a. Approximate depth (in feet) to groundwater: 0-2 minimum 10-20 average
to bedrock: 0 minimum 100 average

Describe any of the following geologic site hazards to groundwater and also identify them on the site map: sinkholes, shallow limestone formations or karst conditions. Describe measures to avoid or minimize environmental problems due to any of these hazards.

AUAR Guidance: A map should be included to show any groundwater hazards identified.

19.a.1 Depth to Groundwater

Groundwater in the project area is typically shallow with depths of 2 to 20 feet common. The regional water table level appears to range from approximately 0 to 300 feet below grade (MGS 1988).

Depth to bedrock in the project area is from approximately 0 to 150 feet, as indicated in the MGS geologic atlas (MGS 1988). Actual depth to bedrock is highly dependant on local topography with depth to bedrock generally greater in river valleys. Bedrock types in this area are primarily Ordovician age limestone, sandstone, and shale.

19.a.2 Sinkhole Probability

The Geologic Atlas was used to evaluate the probability of sinkholes to be present within the project area. The plate indicating sinkhole probability in Olmsted County is based primarily on information provided by local residents and landowners. Other sources regarding sinkhole locations included U.S. Geologic Survey (USGS) topographic maps, NRCS, and aerial photos.

According to the MGS, approximately one-third of the project area is ranked as having a low probability of sinkhole development. Low probability areas are underlain by carbonate bedrock, where essentially no sinkholes were observed. In Olmsted County, very few sinkholes were observed where there is more than 50 feet of cover over bedrock. The other two-thirds of the project area has been ranked as low to moderate probability for sinkhole development. Low to moderate probability areas are underlain with carbonate rock covered with only a thin layer of surficial material, and contains only widely scattered individual sinkholes or isolated clusters of two or three sinkholes. Only one documented sinkhole location is found within the project area as identified by a MGS survey and is shown on Figure 1-6.

19.a.3 Sensitivity to Pollution

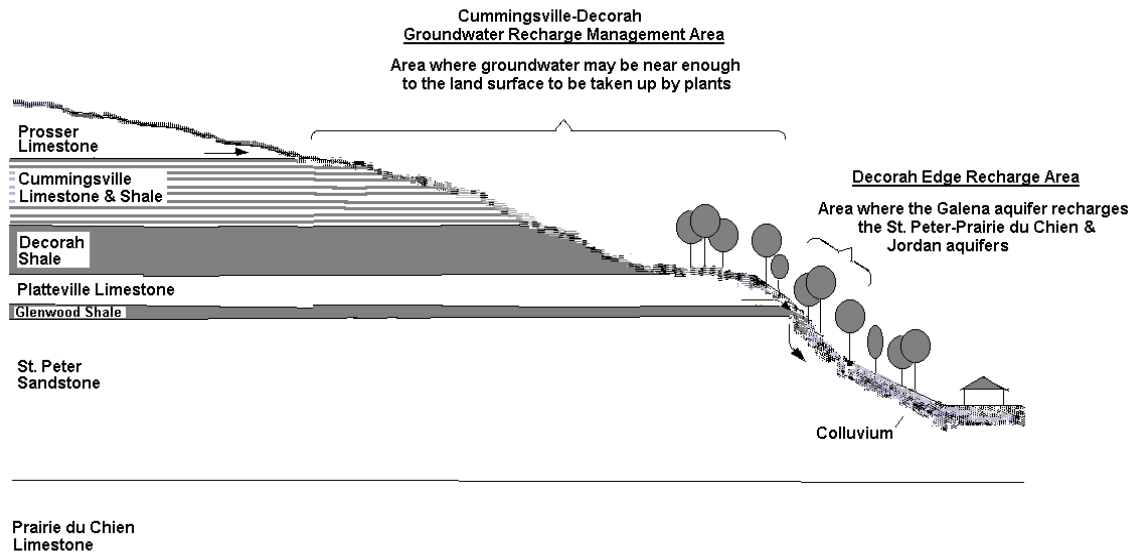
The MGS geologic atlas maps the St. Peter-Prairie du Chien-Jordan Aquifer's overall sensitivity to pollution. This is the aquifer that the City of Rochester uses to obtain water for municipal use. The map indicating the aquifer's sensitivity is based on several assumptions, and is to be used as a general gauge of the overall susceptibility to pollution based on the travel time of pollutants from a surface source to the aquifer. A shorter anticipated time of travel translates into a higher sensitivity rating for the aquifer.

The overall project area has been ranked as high to high-moderate in sensitivity. Hypothetically, contaminants in the high-ranking areas are likely to reach the water table in weeks to years and little natural protection exists to retard the vertical movement of liquids. The areas ranked high-moderate are susceptible to contaminants reaching the water table in several years to a decade.

19.a.4 Decorah-Edge Recharge Area

Figure 1-6 shows the first bedrock unit underlying surficial deposits in the project area. Along steep slopes, groundwater from the upper carbonate group (Galena, Prosser, and Cummingsville units), discharges through soils overlying the Decorah shale and recharge the underlying St. Peter-Prairie du Chien-Jordan aquifer as shown below.

In 1990, the USGS reported that about half of the City of Rochester's groundwater recharge occurs in the Decorah-Edge area. The upper carbonate group has evidence of nitrate and bacterial pollution. Further studies of the hydrogeology and water quality in the Decorah-Edge setting suggest that the soils and vegetation in this area may be functioning as a natural filter removing nitrate as well as bacterial pollution.



Source: Minnesota Geological Survey 1998

In July 2000, the *Rochester Groundwater Recharge Management Area (GRMA) Project* was conducted and identified the following key findings:

- Due to steep slopes and wetness, Decorah-Edge areas are generally not amenable to agriculture or development as compared to adjacent upland and lowland areas. However, as these areas are developed, the Decorah-Edge areas are often targets for infill-development and the next tier of urban and suburban subdivisions.
- There is a distinct correlation between the presence of hydric soils and the continuity and areal extent of the Cummingsville formation. In zones with a small areal extent of Cummingsville formation above the Decorah shale, wetland features are absent or limited in size.
- Hydric soils and wetland features identified in this hydrogeologic setting are often located on head slopes just below the Cummingsville-Decorah contact and on sideslopes at the base of the Decorah formation in the footslope area.
- Head slope areas just downgradient of the Cummingsville-Decorah contact tend to concentrate flows, often resulting in visible springs. During low-flow periods, the discharged water typically reenters the bedrock downslope at or below the Decorah-Platteville contact.
- Although the Decorah-Edge has not been previously identified as highly prone to solution channeling and sinkhole development, there have been two sites within Olmsted County where sinkholes were identified. Solution voids that can lead to sinkhole development have also been identified in the subject setting. These findings are consistent with the large volumes of recharge water encountered.

- To achieve nutrient removal, vegetative buffer designs typically specify 100 feet of mixed vegetation downslope from intensive land uses. Since Decorah slopes range from about 200 to 600 feet in length, they should, in principle, be adequately sized and positioned to function as effective vegetative buffers.
- Field observations suggest that the natural plant communities in these areas are highly sensitive to minor disturbances of the tree canopy and drainage. With disturbance, sedge meadows appear to be displaced by reed canary grass and the woodland understories displaced by buckthorn. Residential development generally results in a conversion to short-rooted turf grasses, ornamental shrubs, and widely spaced trees.
- The level of information detail for geology and soils available at the start of the *GRMA Project* was generally inadequate to use in locating hydrogeologic features, in predicting water related problems, or in developing the model GDPs that were part of the *GRMA Project*. The development of the GDPs led to more detailed mapping of geology and soils.

Additionally, the following experiences related to development were incorporated in the *GRMA Project* report:

- A survey of wet basements and septic system hydraulic failures in the Decorah-Edge setting suggest that problems commonly occur both at the edge and immediately downgradient where the St. Peter sandstone is the first bedrock. Public infrastructure problems such as weeping streets and cracked sidewalks were seen in these same settings.
- Over \$250,000 is spent each year in the Rochester area on retrofitting basement drainage systems and foundation repairs. The cost per household can be as much as \$14,000 plus water damages to interior walls, floor coverings and furniture. In the worst cases, homes overlying high water tables were found to pump over 500,000 gallons per year from basement sumps. Where this water is illicitly discharged to the sanitary sewer, the RWRP incurs unnecessary hydraulic loading.
- Construction on the Decorah shale has led to unstable soil conditions (e.g., slumping and plastic flow) and the emergence of previously hidden springs and seeps. Slope cuts in this setting are particularly prone to water induced soil instability.
- Although there has been some removal of portions of this zone as part of development at several sites around Rochester, complete removal where the Cummingsville formation is intact has not yet occurred.
- There is not a widespread recognition in the consulting and development community of the large volumes of water that can be encountered in these settings. There is even less of an understanding by potential homebuilders and buyers.
- The Decorah-Edge area lies within several political jurisdictions - City, County and Townships. Less than 10 percent of the Decorah-Edge area lies within the current Rochester city limits, and only about 30 percent lies within Rochester's USA, citywide.

- b. Describe the soils on the site, giving NRCS (SCS) classifications, if known. Discuss soil granularity and potential for groundwater contamination from wastes or chemicals spread or spilled onto the soils. Discuss any mitigation measures to prevent such contamination.**

AUAR Guidance: A standard soils map for the area should be included.

19.b.1 Area Soils

A soil map for the area is included as Figure 2-11. Each soil association has a distinct pattern of soils, relief, and drainage. The project area contains three soil associations:

- Racine-Floyd-Maxfield association.
- Rockton-Chanahorn-Atkinson association.
- Dickinson-Plainfield-Kalmarville association.

The Racine-Floyd-Maxfield association consists of silty soils on uplands and in upland drainageways. Local relief between drainageways and summits is approximately 20 to 50 feet, with slopes of up to 18 percent. This association is located in the northwestern and southeastern portion of the project area.

The Rockton-Chanahorn-Atkinson association consists of nearly level to sloping well-drained loamy soils on uplands. These areas are dominated by soils formed in a loamy mantle and in the underlying clay residuum over bedrock. This association is generally on broad uplands, with slopes of up to 12 percent, dissected by deep drainageways. This association covers the central portion of the project area.

The Dickinson-Plainfield-Kalmarville association consists of soils that are nearly level to very steep, well-drained to poorly drained soils that are loamy on outwash terraces and silty on floodplains. This association occurs on terraces, foot slopes, and floodplains in stream valleys with slopes of up to 30 percent. Areas covered by this association within the project area are generally stream corridors.

The geologic atlas indicates that the project area is mainly covered by deposits of Wisconsinan age, chiefly clean calcareous sand and gravel with minor beds of silt and clay in places. The central and eastern portion of the project area consists of mostly colluvium deposits. Colluvium is hillslope deposits derived from bedrock and loess upslope. The southeastern and northwestern portions of the project area consist of outcrops and thinly covered bedrock.

The infiltration rate of soil is influenced by a number of factors, including soil granularity, soil water content, soil frost, temperature, surface roughness, and the nature of the soil pore openings. In addition, factors such as vegetative ground cover and the degree of soil compaction also affect infiltration rates. As discussed previously in Section 19.a.3, the project area has a high to high-moderate sensitivity ranking for groundwater pollution due, in part, to the depth and type of soil cover.

20.0 SOLID WASTES, HAZARDOUS WASTES, STORAGE TANKS

- a. Describe types, amounts and compositions of solid or hazardous wastes, including solid animal manure, sludge and ash, produced during construction and operation. Identify method and location of disposal. For projects generating municipal solid waste, indicate if there is a source separation plan; describe how the project will be modified for recycling. If hazardous waste is generated, indicate if there is a hazardous waste minimization plan and routine hazardous waste reduction assessments.

AUAR Guidance: For a, generally only the estimated total quantity of municipal solid waste generated and information about any recycling or source separation programs of the RGU need to be included.

20.a.1 Solid and Hazardous Waste

Solid animal manure, sludge, and ash are not expected to be produced during construction or operation of future residential, commercial or industrial development projects in the AUAR project area. Only construction debris is expected as a byproduct of development construction projects. Once new homes and businesses are built in the project area, municipal solid waste (MSW) is expected to be the primary waste stream of both entities. Household hazardous waste (HHW) is likely to be produced by homeowners and the types of businesses most apt to be attracted to this area will most likely be classified as Minimal Hazardous Waste Generator's (MG's) or Very Small Quantity Hazardous Waste Generators (VSQG's). Services, trade and light manufacturing dominate employment in Olmsted County.

Olmsted County is the local authority for solid waste management. The County has an established and nationally recognized integrated solid waste management system. Their system is comprised of: a waste reduction program, curbside recycling, rural recycling sheds (for residential drop-off), a recycling center, a hazardous waste facility (for problem wastes, special wastes and hazardous wastes from households, MG's, VSQG's), an MSW waste-to-energy combustion facility, and the Kalmar Landfill (which has separate cells for the disposal of MSW, construction and demolition debris, and ash residue from the combustion of MSW, coal and medical waste). Two major hauling companies handle collection of MSW and recyclables: Superior Services and Waste Management. These firms contract with Olmsted County to dispose of the MSW they collect at Olmsted County facilities. These firms may market the recyclables they collect to any destination. Construction and demolition debris may be taken to any appropriately permitted landfill and is commonly exported to facilities in Iowa, Wisconsin, and elsewhere in Minnesota. Solid waste is regulated under *Olmsted County Solid Waste Ordinance No. 10*.

According to the *Olmsted County Solid Waste Division 10-Year Management and Business Plan - Waste Forecasting Report* (Wenck Associates, Inc., and Sebesta Blomberg and Associates, Inc., September 2001), waste generation rates for 1998 were 0.625 tons/person/year for the residential waste stream and 0.986 tons/employee/year for the commercial/industrial waste stream. Recyclable materials generation was 0.270 tons/person/year in 1998. Hazardous waste management rates for 2001 were calculated to be 0.003 tons/person/year. The Hazardous Waste Facility participation rate for Olmsted County households is approximately 15 percent, one of the highest rates in the state. Given the fact that households typically utilize the Hazardous Waste Facility only once every 2.4 years, Olmsted County staff estimate the effective capture rate of HHW to be about 36 percent of the County's households.

Olmsted County has forecast a range of MSW generation rates over the next ten years, based on population and employment projections. This data is being used to develop plans for facility and program expansion. At this time, Olmsted County is in the planning stages for a two-pronged approach to enhance waste management: increased promotion of waste reduction, recycling and hazardous waste management programs and plans to add a third combustion unit to the waste-to-energy facility. The Kalmar Landfill has a potential site life of 74.7 years for MSW. The County's objective is to insure that all segments of the solid waste stream have viable and appropriate destinations for disposal and management. Furthermore, the County will continue to support the expansion of its MSW facilities so that all MSW generated in Olmsted County can continue to be managed in an environmentally and fiscally sound manner within Olmsted County.

Under current conditions, approximately 21 percent of the AUAR project area that is zoned for residential land use is already developed and about ½ percent of the land that is zoned for industrial/commercial use is developed. At full build out, approximately 79 percent of the area will be low-density residential development and about 2 percent will be industrial/commercial acreage. The remainder of the project area is either undevelopable (due to various environmental and physical constraints), roadways, or parkland. Accounting only for future growth, the undeveloped portions of the area guided for residential development would support approximately 17,500 new residents. This figure is based on a projected total of 6,480 new dwelling units in the project area (see Table 2-7 Project Magnitude Data) and an assumed persons per household ratio of 2.7.

Two neighborhood commercial nodes of eight to ten acres each are included in the development scenario. Assuming a total of 20 acres as the worst-case scenario at a floor area ratio (square feet of floor for each square foot of lot) of 0.15, this results in about 130,000 square feet of commercial space. This would equate to an estimated 250 to 500 potential new jobs (one job per 250 to 500 square feet). Based on a rough estimate of 10 businesses at each center, an estimated 20 new businesses could result. These estimates are based on typical commercial centers that are eight to 10 acres in size, and are consistent with allowable development under the Land Development Manual. Approximately 47-acres of new light industrial development could generate an estimated eight or nine businesses and around 450 new jobs.

Table 2-15 presents a summary of current and future residential waste generation rates. Current waste projections are based on 893 acres of low density developed land at an average density of two units per acre and 2.7 people per unit. The estimate of two units per acre is based on ¼-acre to greater than two-acre lots in the area. For example, Cedar Park has ¼-acre lots, Christopher Woods has ½-acre lots, and the Fair Oaks Subdivision has 2½-acre lots. Future waste projections were based on three units per acre and 2.7 people per unit. Estimates of current and future waste generation rates for the commercial and industrial sectors were not made because residential and business wastes are not segregated in Olmsted County.

TABLE 2-15

**SUMMARY OF CURRENT AND FUTURE WASTE GENERATION
Marion Road Trunk Sanitary Sewer Project AUAR**

Residential Waste Generation Rates	Current Population Estimate	Current Estimate of MSW Totals	Future Population Estimate	Future Estimate of MSW Totals
0.625 tons MSW*/person/year	4,800	3,000 tons per year (t/p/yr)	22,300	13,940 t/p/yr
0.270 tons recyclables/pers./yr	4,800	1,296 t/p/yr	22,300	6,021 t/p/yr
0.003 tons HHW**/person/yr	4,800	14.4 t/p/yr	22,300	67 t/p/yr

* MSW = municipal solid waste.

** HHW = household hazardous waste.

- b. Identify any toxic or hazardous materials to be used or present at the site and identify measures to be used to prevent them from contaminating groundwater. If the use of toxic or hazardous materials will lead to a regulated waste, discharge or emission, discuss any alternatives considered to minimize or eliminate the waste, discharge or emission.**

AUAR Guidance: b. No response necessary. No response necessary.

20.b.1 Toxic and Hazardous Materials

- c. Indicate the number, location, size and use of any above or below ground tanks to store petroleum products or other materials, except water. Describe any emergency response containment plans.**

AUAR Guidance: c. Potential locations of storage tanks associated with commercial uses in the AUAR should be identified (e.g., gasoline tanks at service stations).

20.c.1 Storage Tanks

Table 2-16 is a list of eight sites found within the project area that are on the MPCA Leaking Underground Storage Tank (LUST) list.

TABLE 2-16

**MPCA LUST SITES WITHIN THE PROJECT AREA
Marion Road Trunk Sanitary Sewer Project AUAR**

MPCA LUST ID No.	Site Name	Address	Closure Date
5483	Rochester Armory	1715 Marion Road SE	02/10/95
5868	OMS #2, National Guard	1715 Marion Road SE	02/03/93
7388	Strains Bus Company	2450 30 th Avenue SE	06/04/96
7878	Former UPS Building	2111 Marion Road	11/17/97
8445	Manges Residence	4314 Canfield Court SE	02/02/96
10865	Little Store	3335 Marion Road	04/27/98
11485	Eastwood Golf Course	3505 Eastwood Road SE	03/11/99
12808	Ace World Wide Moving	2725 Whynaught Court SE	Open

Commercial nodes allowed in residential areas under the development scenario and areas zoned for light industrial/commercial use would allow for gas tanks at service stations. Other tanks related to commercial and light industrial use could be needed, but cannot be specifically identified as to type and/or location at this time.

21.0 TRAFFIC

Parking spaces added NA. Existing spaces (if project involves expansion) NA. Estimated total average daily traffic generated 59,115. Estimated maximum peak hour traffic generated (if known) and time of occurrence NA

Provide an estimate of the impact on traffic congestion on affected roads and describe any traffic improvements necessary. If the project is within the Twin Cities metropolitan area, discuss its impact on the regional transportation system.

AUAR Guidance: For most AUAR reviews a relatively detailed traffic analysis will be needed, especially if there is to be much commercial development in the AUAR area or if there are major congested roadways in the vicinity. The results of the traffic analysis must be used in the response to item 22 and to the noise aspect of item 24.

Instead of responding to the information called for in item 21, the following information should be provided:

- *A description and map of the existing and proposed roadway system, including state, regional, and local roads to be affected by the development of the AUAR area. This information should include existing and proposed roadway capacities and existing and projected background (i.e., without the AUAR development) traffic volumes;*
- *Trip generation data - trip generation rates and trip totals - for each major development scenario broken down by land use zones and/or other relevant subdivisions of the area. The projected distributions onto the roadway system must be included;*

- *Analysis of impacts of the traffic generated by the AUAR area on the roadway system, including: comparison of peak period total flows to capacities and analysis of Levels of Service and delay times at critical points (if any);*
- *A discussion of structural and non-structural improvements and traffic management measures that are proposed to mitigate problems;*

Note: in the above analyses the geographical scope must extend outward as far as the traffic to be generated would have a significant effect on the roadway system and traffic measurements and projections should include peak days and peak hours, or other appropriate measures related to identifying congestion problems, as well as ADTs.

21.1 Introduction

As part of this AUAR document, a traffic study was completed to analyze and document the expected traffic impacts of potential future land development in the sewer and water extension area. This report documents the results of the traffic study and provides information necessary to complete the AUAR document. Appendix B contains the detailed traffic impact study completed as part of this AUAR document. The following is a summary of that study. The purpose of the traffic analysis is to identify potential traffic impacts associated with existing conditions and the hypothetical development scenario and to identify strategies for mitigating these potential impacts.

21.2 Existing Conditions

Currently, the project area is largely undeveloped but has scattered residential developments of varying densities along with pockets of commercial and industrial development along Marion Road. In order to analyze the traffic impacts associated with the existing development, key intersections and road segments were identified, traffic data was obtained at these locations, and the quality of traffic operations at these locations was estimated.

21.2.1 Key Intersections Analyzed

The key intersections selected in southeast Rochester for analysis as part of this traffic study include:

1. TH 14/Marion Road.
2. TH 14/40th Avenue.
3. Marion Road/Eastwood Road.
4. Marion Road/20th Street.
5. Marion Road/40th Avenue.

21.2.2 Key Roadways Analyzed

The key roadways selected in southeast Rochester for analysis as part of this traffic study include:

1. TH 14 from 11th Ave (CSAH 1) to 50th Ave (CSAH 11).
2. Marion Road (CSAH 36) from TH 14 to 30th St.
3. Eastwood Road (CR 144) from Marion Rd (CSAH 36) to 40th Ave.
4. 20th Street (CR 143) from Marion Rd (CSAH) 36 to 50th Ave (CSAH 11) – plus possible future connection from 11th Ave (CSAH 1) to Marion Rd (CSAH 36).
5. 40th Avenue from TH 14 to Eastwood Rd (CR 144) – plus possible future connection from Eastwood Rd (CR 144) to 20th St (CR 143).
6. Pinewood Road from 11th Ave (CSAH 1) to 30th Ave.
7. 30th Avenue from Marion Rd (CSAH 36) to Pinewood Rd.
8. 50th Avenue (CSAH 11) from TH 14 to CR 143 (N JCT).

21.2.3 Identification of Existing Deficiencies

Existing traffic count data was collected for the key roadways and intersections identified. These counts plus existing roadway geometry and traffic control information were used to calculate a Level-of-Service (LOS) for each key roadway and intersection. LOS is a recognized standard used by traffic engineers to estimate the quality of traffic flow, or level of congestion on a roadway or at an intersection. The results of a LOS analysis are typically presented in the form of a letter grade (A through F). Much like an academic report card, LOS A represents conditions with “free-flow” traffic at higher speeds with little or no delays. Conversely, LOS F conditions are represented by considerable congestion with long delays and queuing.

Although LOS A conditions represent the best possible level of traffic flow, it is not feasible to build urban roadways and intersections to such high standards. Therefore, in the Rochester area, the Rochester-Olmsted County Council of Governments (ROCOG) has set the index of congestion for major urban roadways and intersections (such as Hwy 14 and Marion Rd) at the LOS C/D boundary while the congestion index for secondary roadways and intersections (such as 20th St SE and 40th Ave SE) is the LOS D/E boundary. This index indicates that LOS C conditions during the peak hour of traffic would be considered acceptable for major urban roadways and intersections, whereas LOS D conditions would be considered congested and deficient.

Likewise, for secondary roadways and intersections, LOS D conditions during the peak hour of traffic would be considered acceptable whereas LOS E conditions would be considered congested and deficient. It should be noted that, for each individual movement at a specific intersection, the E/F boundary is always used as the indicator of congestion, regardless of the type of roadway. However, it should also be noted that LOS E is not desirable and intersections with individual movements at LOS E should be

evaluated for potential improvements. The following is a summary of the index of congestion for the roadways and intersections analyzed as a part of this AUAR:

- Primary Roadways and Intersections (TH 14 and Marion Road): LOS C/D boundary.
- Secondary Roadways and Intersections (Eastwood Road, 40th Avenue, etc): LOS D/E boundary.
- Individual Movements at all intersections: LOS E/F boundary.

Existing LOS deficiencies in the project area were identified by comparing the LOS results to the index of congestion established by ROCOG. The intersections of TH 14/Marion Road and Marion Road/Eastwood Road were also examined for queuing deficiencies. Intersection approaches were determined to have queuing deficiencies if traffic queues from one intersection extended into the adjacent intersections or blocked commercial driveways. The following LOS and queuing deficiencies were identified:

- The TH 14/Marion Road intersection operates at LOS D in the PM peak hour.
- During the PM peak hour, queues from the north approach of the TH 14/Marion Road intersection were observed extending past a commercial access to a grocery store, effectively impeding access. Also, a queuing analysis revealed that vehicles turning left from the south approach during the PM peak hour will periodically exceed the available storage length and impact the adjacent through lane.

It should be noted that the north approach through and left turn movements along with the south approach left turn movements at the TH 14/Marion Road intersection operate at LOS E during the PM peak hour. While not deficient, LOS E is not desirable and this intersection should be evaluated further to determine if operational improvements can be completed. Likewise, the Marion Road/Eastwood Road intersection is not deficient but the west approach is operating at LOS E. This intersection is not currently in need of further study because the west approach is a convenience store driveway with less than 10 vehicles using it as an intersection approach in the PM peak hour. These vehicles have the option to utilize another driveway to the north. Finally, the TH 14/40th Avenue intersection operates at LOS D during the PM peak hour but is not considered deficient because 40th Avenue is a secondary roadway.

21.3 Future Conditions

For the purposes of completing the AUAR, a future land development scenario was established for the AUAR project area. The land development scenario was created to represent the highest intensity of land use expected in the project area at full build out, which is estimated to occur by 2025. It should be noted that if future land development in the project area does not reach the level defined in the development scenario, expected traffic impacts may differ from what is presented. This could result in needing less mitigation to maintain acceptable operating conditions.

21.3.1 Year 2025 Land Development Scenario Description

The future land development expected to occur in the project area between now and 2025 is generalized as follows:

- 3,160 Single-Family Dwelling Units.
- 3,140 Multi-Family Dwelling Units.
- 180 Elderly/Senior Housing Dwelling Units.
- 1,760 Square Feet of General Commercial Development.
- 130,000 Square Feet of Neighborhood Commercial Development.
- 579,500 Square Feet of Industrial Development.
- 33 Acres of Undeveloped Parkland.

21.3.2 Year 2025 Traffic Forecasts

Year 2025 traffic forecasts were initially developed for two scenarios, which are:

- Year 2025 No Development Scenario: Assumes that no new land development and no roadway improvements would be made in the project area between now and 2025.
- Year 2025 Development Scenario: Assumes the hypothetical land development scenario presented in Part II, Section 6.0 would be established in the project area by 2025. This scenario also assumes that a new 40th Avenue connection between Eastwood Road and 20th Street would be constructed in the study area.

A number of additional traffic forecasts were developed to analyze the impact of other potential roadway improvements in the study area. These forecasts were used to evaluate the effectiveness of the other potential improvements as a mitigation measure and are discussed in more detail in the complete traffic study (Appendix B).

Traffic forecasts were developed using the ROCOG Travel Demand Model. ROCOG staff provided year 2025 average daily traffic (ADT) model assignments for the forecast scenarios analyzed. These ADT model assignments were used to develop ADT forecasts for the key roadways. The ADT forecasts were developed by adjusting the model assignments as needed to account for the deviation between corresponding base year traffic counts and assignments.

The model assignments were also used to develop intersection turn movement forecasts. This was completed by using the model assignments to factor up existing turn movements to year 2025 or, for intersections where turning movement proportions are estimated to change dramatically in the future, the assignments were factored to reflect peak hour conditions.

It should be noted that vehicle trips such as those traveling to and from the project area were distributed between Traffic Analysis Zone (TAZ's) using the gravity model (Appendix B). The gravity model determines the number of trips between TAZ's based on the number of trip ends being generated out of each TAZ as well how close each TAZ is to every other TAZ. In short, the closer the two TAZ's are, the greater number of trips between them. Also, the greater number of trips in each pair of TAZ's, the greater number of trips between the TAZ's.

Vehicle trips in the project area were assigned to the model using an equilibrium assignment. An equilibrium assignment is a procedure where vehicle trips are iteratively assigned to the highway network until no vehicle trips can be assigned to an alternate path without increasing the total travel time of all trips in the network. This iterative procedure adjusts travel times between locations to account for travel delay related to roadway congestion.

21.3.3 Year 2025 No Development Scenario

Traffic forecasts for a year 2025 No Development Scenario were developed and analyzed to determine if there are traffic impacts associated with background traffic growth in the project area. Any impacts related to the background growth would be expected to occur even if no new land development occurs within the project area.

21.3.3.1 Year 2025 No Development Level of Service and Queuing Analysis Results – Without Improvements

Using the traffic forecasts for the No Development Scenario, an LOS and queuing analysis was completed. The LOS results for the key roadways and intersections were compared against the ROCOG's index of congestion. The key roadways and intersections determined to have LOS and queuing deficiencies under the 2025 No Development Scenario are as follows:

LOS Deficient Roadways

- TH 14 east of 40th Avenue (expected to operate at LOS D).

LOS Deficient Intersections

- TH 14/Marion Road Intersection (LOS F in PM Peak hour).
- Marion Road/Eastwood Road Intersection (Convenience Store Driveway through movement at LOS F in PM peak hour) - LOS worsens on other approaches because improvements to the TH 14/Marion Road intersection result in more peak hour traffic on Marion Road at Eastwood.)

Intersections with Queuing Deficiencies

- During the PM peak hour, TH 14/Marion Road Intersection is estimated to create queues extending through the TH 14/11th Avenue intersection to the west and the Marion Road/Eastwood Road intersection to the south and also block access to local businesses on the north.

21.3.3.2 Year 2025 No Development Level of Service and Queuing Analysis Results – With Improvements

The roadway and intersection-related improvements identified here could be implemented to eliminate the project area roadway and intersection deficiencies for the 2025 no-development scenario. The different types of improvements examined include roadway reconstruction, altering traffic control, and optimizing the existing signal system. A number of different types of improvement strategies were iteratively examined in order to determine the best mix of improvements. Based on this process, the following improvements were identified:

1. Reconstruct the TH 14/Marion Road intersection to accommodate dual left turns, two through lanes, and a right turn lane on all approaches.
2. Install a traffic signal at the Marion Road / Eastwood Road intersection. (Along with installing a traffic signal at the Marion Road/Eastwood Road intersection, the relocation of the Eastwood Road approach to approximately 600 feet to the south of its existing location should be considered even though it is not required. Doing this would allow the intersection to meet Mn/DOT's recommended minimum spacing guidelines between signalized intersections and to provide adequate distance between intersections such that the zones of influence that effect drivers do not overlap. However, it should be noted that relocation of the intersection would require additional right-of-way, potential property acquisitions and significant grading of the existing steep, forested slopes.)
3. Construct TH 14 as a four-lane expressway east of 40th Avenue through the 50th Avenue intersection. Improve the sight distance on TH 14 at the 40th Avenue intersection by reconstructing the vertical alignment on TH 14 to provide more gradual vertical grade changes near the 40th Avenue intersection. (Mn/DOT is currently in the early stages of examining the feasibility of converting TH 14 to a four-lane expressway between 40th Avenue and Eyota, Minnesota, to the east.)

21.3.4 Year 2025 Development Scenario

In order to estimate the traffic impacts associated with the land development scenario, trip ends (i.e. the origin or destination point of a trip) need to be estimated for each TAZ from the land uses projected to occur in the project area. Using the trip generation equations from the ROCOG travel demand model, over 59,000 new daily trip ends were estimated to be generated by the projected land development. These trip ends were input into the model so they could be distributed and assigned to the model network. Traffic forecasts for the year 2025 Development Scenario were then developed from these model assignments. It should be noted that, as a part of this scenario, a new 40th Avenue connection between Eastwood Road and 20th Street was assumed to be built. The rationale for the 40th Avenue connection is provided in the full traffic study (Appendix B).

21.3.4.1 Year 2025 Development LOS and Queuing Analysis Results – Without Improvements and Mitigations

Using the traffic forecasts for the development scenario, an LOS and queuing analysis was completed. The year 2025 development scenario ADT and turn movements for the key roadways and intersections were analyzed to identify LOS and queuing deficiencies. The LOS results for the key roadways and intersections were compared against ROCOG's index of congestion. The key roadways and intersections determined to have LOS and queuing deficiencies under the 2025 development scenario are as follows:

LOS Deficient Roadways

- TH 14 east of 40th Avenue (expected to operate at a LOS D).
- Marion Road between TH 14 and Eastwood Road (expected to operate at a LOS E).
- Marion Road between 20th Street and 40th Avenue (expected to operate at a LOS E).

LOS Deficient Intersections

- TH 14/Marion Road Intersection (LOS F in AM and PM peak hour).
- Marion Road/Eastwood Road Intersection (LOS F in AM and PM peak hour).
- TH 14/40th Avenue Intersection (LOS F in AM and PM peak hour).

Intersections with Queuing Deficiencies

- During the PM peak hour, TH 14/Marion Road Intersection is estimated to create queues extending through the TH 14/11th Avenue intersection to the west and the Marion Road/Eastwood Road intersection to the south. Also, the queues on the north approach are expected to block access to local businesses.

21.3.4.2 Year 2025 Development LOS and Queuing Analysis Results – With Improvements and Mitigations

The roadway and intersection-related improvements and mitigations listed here could be implemented to eliminate the project area roadway and intersection deficiencies for the 2025 development scenario. For the purposes of this document, “improvements” are defined as roadway enhancements needed to eliminate deficiencies that are expected to occur under the 2025 no-development scenario. “Mitigations” are defined as roadway enhancements that are required to eliminate the additional 2025 deficiencies that are associated solely with the development scenario.

The implication of the above definitions is that improvements would be necessary by 2025 even if the project area does not develop. It will be necessary to implement mitigations, on the other hand, incrementally as future development occurs. It should be noted that the development scenario identified here is a hypothetical “worst-case” scenario. The timing and intensity of additional development in the project area will dictate when, where, and what roadway enhancements are needed. It should also be

noted that the improvements and mitigations identified in this traffic study affect roadways maintained by different jurisdictions such as the state, county, the City of Rochester, and Marion Township. Therefore, improvements and mitigations identified on state and county roadways will require state and county involvement.

The different types of improvements and mitigations examined include existing roadway reconstruction, new roadway construction, altering traffic control, and optimizing the existing traffic signal system. A number of different types of improvement and mitigation strategies were iteratively examined in order to determine the best mix of enhancements. Based on this process, the following improvements and mitigations were identified:

Roadway and Intersection Improvements

(Improvements are enhancements recommended under the 2025 no-development scenario)

1. Reconstruct the TH 14/Marion Road intersection to accommodate dual left turns, two through lanes, and a right turn lane on all approaches.
2. Install a traffic signal at the Marion Road/Eastwood Road intersection. (Along with installing a traffic signal at the Marion Road/Eastwood Road intersection, the relocation of the Eastwood Road approach to approximately 600 feet to the south of its existing location should be considered even though it is not required. Doing this would allow the intersection to meet Mn/DOT's recommended minimum spacing guidelines between signalized intersections and to provide adequate distance between intersections such that the zones of influence that effect drivers do not overlap. However, it should be noted that relocation of the intersection would require additional right-of-way, potential property acquisitions and significant grading of the existing steep, forested slopes.)
3. Construct TH 14 as a four-lane expressway east of 40th Avenue through the 50th Avenue intersection. Improve the sight distance on TH 14 at 40th Avenue by reconstructing the vertical alignment on TH 14 to provide more gradual vertical grade changes near the 40th Avenue intersection

Roadway and Intersection Mitigations

(Mitigations are enhancements that would be needed under full build out of the 2025 development scenario in order to achieve desired levels-of-service. They would be in addition to the improvements listed above.)

1. At the TH 14/40th Avenue intersection.
 - Install a traffic signal with “exclusive” only left turn phasing for all approaches.
 - Construct the north approach to accommodate a left turn, through, and right turn lane.
 - Construct the south approach to accommodate dual left turn lanes, a through lane, and a right turn lane.

2. Construct Marion Road as a four-lane divided roadway between 20th Street and 40th Avenue.

The mitigations identified apply to county and state roadways. Therefore, if the project area is built out according to the development scenario and future-year traffic results in congestion necessitating these mitigations, it is expected that Olmsted County and Mn/DOT would lead the design, construction, and financing of their respective facilities. The role of the City of Rochester would be to participate in project development, right-of-way acquisition and financing based on established project participation guidelines of MnDOT and Olmsted County.

Factors influencing Implementation of Improvements and Mitigations

Signal Justification Reports

As stated in the no-development scenario, prior to installation of a traffic signal, a Signal Justification Report (SJR) should be completed including an analysis of the documented warrants for signalization. Based on the development scenario volumes at the TH 14/40th Avenue and Marion Road/Eastwood Road intersections, Attachment B in Appendix B shows that both intersections would be expected to exceed the traffic volume thresholds for the Peak Hour Volume Warrant (Warrant 11). An approximate straight-line analysis between the existing and 2025 development volumes was conducted to determine when the peak hour volume warrant would be expected to be met for both intersections. If the traffic volumes increase at a constant rate, the peak hour volume warrant could potentially be met by 2006 for the TH 14/40th Avenue intersection and by 2008 for the Marion Road/Eastwood Road intersection. However, it is not likely that the development will occur constantly from year to year. It is more likely that the expected development will occur in steps. For example, in one or two years there may be no new development, and then the next year, several residential units may be constructed.

Correcting Sight Distance at TH 14/40th Avenue SE intersection

Currently, there is poor sight distance for vehicles on TH 14 near the 40th Avenue intersection and for vehicles entering TH 14 from the 40th Avenue north and south approaches. Prior to installation of a traffic signal at this intersection, the sight distance would need to be improved so that vehicles traveling on TH 14 would have adequate time to react to signal changes. Correcting the intersection sight distance has been identified as part of the necessary TH 14 improvements, regardless of whether additional development occurs in the project area. Improving the sight distance would involve reconstructing the vertical alignment on TH 14 by providing more gradual vertical grade changes near the 40th Avenue intersection. In addition to improving the sight distance, advance warning flashers (AWF) could also be installed on TH 14 to provide a supplementary notification of the signal change. MNDOT has identified the upgrading of TH 14 to a four-lane east to Eyota, Minnesota, in its Work Studies Program as a candidate project for the Year 2008. This project would include correction of the sight distance problems at this intersection.

Marion Road Roadway Capacity north of Eastwood Road

Due to the close spacing of the TH 14 and Eastwood Road intersections on Marion Road (approximately 800 feet apart), the level of service on this section of roadway is expected to be controlled by the capacity at the intersections. One of the improvements identified for the No-Development Scenario was to add a

second left turn lane and right turn lane on the south approach at the TH 14/Marion Road intersection. Addition of these turn lanes is expected to increase the capacity at this intersection and thus increase the capacity of Marion Road between TH 14 and Eastwood Road by approximately 300 vehicles per hour per lane. Therefore, the total capacity of this roadway section is expected to increase to 1,100 vehicles per hour per lane with the improvements and the roadway segment is expected to operate at a LOS A for the development scenario.

20th St SE Extension

It was determined that, even with the improvements and mitigations identified, the TH 14/Marion Road intersection is expected to operate at an overall LOS D during the PM peak hour under the 2025 Development Scenario. It should be noted that all individual movements associated with the intersection operated at acceptable levels of service. This suggests that under full build out of the Development Scenario, there *may* be a point in time where the overall operation of the TH 14/Marion Road intersection will deteriorate to where it would be considered deficient. This assumes that the actual pattern of traffic growth reflects the assumptions made in the traffic study (see Appendix B).

In an effort to identify additional mitigation measures that could raise the overall LOS for this intersection to the C/D boundary if the projected traffic growth was realized, an analysis examining the effects of constructing a new 20th Street connection between Marion Road and 11th Avenue (CSAH 1) was conducted. The 20th St connection is a corridor identified on the regional long range thoroughfare plan and it is a facility that would connect two county road corridors on east (CSAH 36 and CR 143) with two county road corridors on the west (CSAH 1 and CR 146). The analysis found that construction of the 20th St connection would likely raise the overall level of service at the intersection of Marion Road and TH 14 to a LOS C, compared to LOS D without the connection. This suggests that if conditions at the Marion Road/TH 14 intersection continue to deteriorate even after identified improvements are made, there may be a need to consider the extension of the 20th St as a measure to address potential congestion problems at the TH 14 Marion Road intersection in the future.

Similarly, the growth of traffic on Marion Road between 20th St and 40th St varies with the presence or absence of the 20th St extension, such that the need for widening this section of Marion Road is linked to not only the extent of development in the study area but the presence or absence of the 20th St extension as well.

Given the uncertainty in terms of both the extent of development in the study area and traffic growth on various road segments and at various intersections, a Monitoring Program (as discussed in Section 21.4) is proposed to track traffic growth to determine when the City of Rochester should initiate, in conjunction with the appropriate road authorities, further studies and project development activities to determine the timing and phasing of actual improvement needs. Such activities are a necessary step leading to capital programming decisions to address deficiencies in roadway operation. While the AUAR identifies the need for potential mitigation measures, it cannot dictate programming decisions that need to follow the normally accepted practices of the roadway authorities, including Mn/DOT (in the case of TH 14, for example) and Olmsted County (in the case of Marion Road, for example).

In order to understand what level of proposed development may trigger LOS D or worse conditions at the TH 14/Marion Road intersection (assuming all intersection improvements are made), an analysis was

completed to determine what level of traffic above the conditions existing today would clearly cause the level of service to drop to LOS D. The analysis utilized the PM peak hour intersection forecasts of the no-development and development scenarios to determine what level of traffic would trigger the drop in LOS. The differences in the PM peak hour turning movement volumes between the two scenarios at the TH 14/Marion Road intersection were first calculated. The differences for each movement were then added to the no-development PM peak hour turning movement volumes in 5 percent increments and re-analyzed until it was evident that the intersection would operate at LOS D during the PM peak hour under the given forecast conditions.

The analysis revealed that LOS D conditions would likely occur at the TH 14/Marion Road intersection when the PM peak hour traffic increases to 85 percent over the existing level of traffic at the intersection. This suggests that a significant share of the study area development scenario could be built out before traffic conditions would suggest the need to consider implementing a 20th St SE extension. Therefore, further study of whether a new 20th Street connection should be constructed would not need to occur until much of the development is already in place. In order to provide adequate time for study prior to reaching 85 percent of full traffic growth, it is recommended that the necessary studies to determine if a new 20th Street connection should be constructed be initiated once the level of traffic at the TH 14/Marion Road intersection exceeds 70 percent of level assumed in the full development scenario. This should provide enough time to determine if 20th Street may be needed before conditions at the TH 14/Marion Road intersection deteriorate below a LOS C.

Roadway and Intersection Mitigations Needed if New 20th Street Connection is Programmed

If the extent of development and traffic growth requires consideration of the 20th St connection, the following ancillary improvements at the Marion Road/20th Street intersection and the Marion Road/40th Avenue intersection should be considered:

1. At the Marion Road/20th Street intersection:
 - Install a traffic signal with “exclusive/permitted” left turn phasing for all approaches.
 - Design Marion Road (north and south approaches) to provide a left-turn lane, two through lanes, and a right turn lane.
 - Design 20th Street (east and west approaches) to provide a left-turn lane, at least one through lane , and a right-turn lane.
2. At the Marion Road/40th Avenue intersection:
 - Design the 40th Avenue approach to provide a left and right turn lane.
 - Design the Marion Road north approach to provide a left turn and through lane.
 - Design the Marion Road south approach to provide a through and right turn lane.

21.4 Implementation Issues Associated with Improvements and Mitigations

21.4.1 Traffic Signal Installation

Mn/DOT recently published access spacing guidelines. Based on these guidelines, traffic signals at the intersections of TH 14 and 40th Avenue and Marion Road and 20th Street would be in compliance with these guidelines. Before any signals can be installed, a Signal Justification Report (SJR) would need to be completed and approved by Mn/DOT and Olmsted County before construction could begin.

However, installation of a traffic signal at the Marion Road/Eastwood Road intersection at its current location would not meet the recommended minimum spacing guidelines being developed by Mn/DOT but would improve level-of-service.

21.4.2 Jurisdictional Issues

The key roadways listed in the project area are owned and maintained by different agencies, which include Mn/DOT, Olmsted County, the City of Rochester, and Marion Township. If it is determined that improvements and/or mitigations are necessary to improve the traffic operations at a particular intersection or roadway section, coordination should occur between the governing agencies of the roadways to develop an improvement/mitigation strategy, determine right-of-way acquisition, etc. The key roadways and their associated governing agency are listed as follows:

1. TH 14 - Mn/DOT.
2. Marion Road (CSAH 36) - Olmsted County.
3. 11th Avenue (CSAH 1) - Olmsted County.
4. Eastwood Road (CR 144) - Olmsted County.
5. 20th Street (CR 143) - Olmsted County.
6. 40th Avenue - Olmsted County (partial) and Marion Township (partial).
7. 30th Avenue - Marion Township.
8. Pinewood Road - City of Rochester (partial) and Marion Township (partial).

For example, for the 2025 no development scenario, a potential improvement was listed that included constructing the TH 14/Marion Road intersection to provide dual left turn lanes, two through lanes, and a right turn lane on all approaches. TH 14 is owned and maintained by Mn/DOT, Marion Road is owned and maintained by Olmsted County, and 15th Avenue is owned and maintained by the City of Rochester. Therefore, when the improvement at this intersection becomes warranted (intersection operations are LOS D, E, or F), coordination among Mn/DOT, Olmsted County, and the City of Rochester should occur to discuss the geometric design of the intersection, to determine the timing of the design and construction of the intersection and to determine the appropriate right-of-way acquisition needed.

21.4.3 Traffic Monitoring for Improvements/Mitigations

The proposed development of the single and multiple-family residential units and commercial and industrial buildings is expected to occur incrementally over the next 25 years in the project area. Therefore, implementation of all improvements and mitigations listed are not expected to be needed immediately or at the same time. The timing and magnitude of the improvements and mitigations will be dependent on the size, type, and location of the developments that occur each year both inside and outside of the project area. Which improvements and mitigations will be needed first will depend on where and when the developments occur.

It must be remembered that the development scenario examined here is a hypothetical scenario. If future land development in the project area deviates significantly from the proposed scenario, then the traffic impacts and ensuing potential improvements and mitigations might differ from what has been presented in this report.

Given that there are many uncertainties surrounding the timing and need for roadway improvements associated with development in the study area, it is recommended that the initial mitigation strategy associated with traffic impacts should be the establishment of a traffic monitoring program to track traffic growth on area roadways. The purpose of the traffic-monitoring program is to:

1. Identify if traffic has increased on key roadways in the study area?
2. Identify whether the increase in traffic is of such magnitude to warrant initiation of further assessment, project development, and programming recommendations?

In order to address the questions above, locations where project roadways should be monitored periodically need to be identified. Below are suggested locations for the appropriate state and local transportation departments to monitor traffic volumes in order to determine: (1) If roadway enhancements should be considered at that time, (2) if further study should begin, or (3) If the roadway is able maintain mobility without enhancements.

1. TH 14 West of Marion Road - MnDOT.
2. TH 14 East of Marion Road - MnDOT.
3. TH 14 West of 40th Avenue - MnDOT.
4. TH 14 East of 40th Avenue - MnDOT.
5. 40th Avenue South of TH 14 - Olmsted County (partial) and Marion Township (partial).
6. Marion Road North of Eastwood Road - Olmsted County.
7. Marion Road South of 20th Street - Olmsted County.
8. Eastwood Road East of Marion Road - Olmsted County.
9. 20th Street East of Marion Road - Olmsted County.

The type of monitoring that could be used would involve collecting hourly approach volumes over a 48-hour time period on a “typical” day in both directions on the roadway. A “typical” day is usually considered a Tuesday, Wednesday, or Thursday where no special events (concerts, major detours, traffic incidents, etc.) occur. These hourly approach volumes could then be averaged and summed over a 24-hour time period to develop average daily traffic volumes. These daily traffic volumes could then be used as a guide to determine if potential improvements and/or mitigations should be studied further. The objective of additional study would be to determine if the improvement in question should enter the project development and implementation phase.

As a recommendation, the appropriate roadway authority should monitor the specific locations where development is expected to occur at least every four years. If the city receives a request for a large development occurring in the interval between monitoring years, a Traffic Impact Study, consistent with the requirements of the City of Rochester, will be needed to assess the impact of the development on study area streets in the immediate area.

21.4.3.1 Traffic Monitoring for Signalization Needs

Included below is a listing of the intersections and locations where the volume counts are suggested to be collected at least every four years by the appropriate road authority. These counts should be compared against the chart found in Figure 4-3 of Appendix B. If the counts fall within the “warrant met” area of the chart, further study should be initiated to determine if a signal is actually warranted. The key intersections that should be monitored are listed below along the corresponding count locations.

- TH 14/40th Avenue Intersection - Olmsted County, MnDOT, and Marion Township (partial).
- Marion Road/Eastwood Road Intersection - Olmsted County.
- Marion Road/20th Street Intersection - Olmsted County.

21.4.3.2 Traffic Monitoring for Capacity Improvements/Mitigation Needs

Traffic monitoring counts from key roadways should be applied against the chart found on Figure 4-4 of Appendix B to determine if potential improvements and/or mitigations for the roadway should be studied further. Given ROCOG’s index of congestion varies from the LOS C/D boundary to the LOS D/E boundary, a reasonable threshold for determining if roadway volumes suggest further study is the mid LOS C level. Below is a list of key roadways where facility type and intersection approach improvements may be needed. The monitoring count locations to help determine if potential improvements should be studied are identified in Appendix B for each intersection.

- TH 14 West of Marion Road - MnDOT.
- TH 14/Marion Road Intersections - MnDOT (partial) and Olmsted County (partial).
- 20th Street Connection - Olmsted County.
- Marion Road/20th Street Intersection - Olmsted County.

The thresholds selected for further study were developed knowing that the development and construction of roadway improvements can take anywhere from two to more than ten years depending on a number of factors. For example, some of the identified improvements and mitigations may require additional environmental documentation, detailed engineering design, and extensive right-of-way acquisition. The number of years required to implement a project is dependent on how each of these issues affects project development. The monitoring thresholds are designed to provide a period of time to develop an improvement project prior to the roadway or key intersection in question becoming deficient operationally.

21.5 Future System and Right-Of-Way Considerations

The following paragraphs discuss issues related to the recommended roadway improvements and mitigations that are not needed to satisfy roadway operational goals, but that should be considered as part of overall roadway system planning for the purpose of providing for efficient roadway operation in the future.

21.5.1 Marion Road-Lane Continuity

Marion Road is currently a four-lane undivided roadway from TH 14 south to Bear Creek. South of Bear Creek Marion Road becomes a two-lane road. Projected 2025 traffic volumes under the no-development scenario indicate a need to widen Marion Road to four lanes from CR 11 to TH 52. Consideration should be given in the future to widening the section of Marion Road between Bear Creek and CR 11 to four lanes to maintain lane continuity and prevent the creation of bottlenecks at north and south transition points if a four lane upgrade is completed between CR 11 and TH 52.

21.5.2 North-South Roadway Facility Types and Functional Classification

As stated previously, 40th Avenue was modeled to reflect a likely future connection between Eastwood Road and 20th Street. If built, the 40th Avenue connection may be classified as either a Major Collector or even a Minor Arterial. Even though initial forecasts indicate that 40th Avenue could be built as a two-lane roadway between TH 14 and Eastwood Road, its future facility type should be examined further from a system context. From a system standpoint, creating a three-lane or four-lane arterial in the project area between TH 14 and TH 52 would enhance mobility when the project area urbanizes. Further study of both the proposed 40th Avenue connection and existing 50th Avenue between TH 14 and TH 52 should be considered to better determine if it is feasible to construct either roadway as a three-lane or four-lane facility.

The current Marion Road/40th Avenue intersection is located approximately 200 feet northwest of the Marion Road/29th Street intersection. With the addition of background and development traffic volumes, the close spacing of these intersections could potentially decrease operations and increase the number of crashes at each intersection and on Marion Road. Two improvements that should be considered for implementation include:

1. Relocate the Marion Road/40th Avenue intersection approximately 900 feet to the northwest, which would result in an intersection spacing of approximately 1,100 feet, OR
2. Realign 40th Avenue to intersect perpendicular to Marion Road and realign 29th Street to intersect 40th Avenue instead of Marion Road.

Either of the alternatives listed may require the acquisition of right-of-way in residential areas.

21.5.3 East-West Roadway Facility Types and Functional Classification

Eastwood Road currently has a functional classification of “local” roadway and is considered a secondary roadway under the ROCOG index of congestion guidelines. Traffic forecasts with the proposed development indicate that the roadway is expected to operate at acceptable levels as a two-lane roadway. However, if this roadway were upgraded from a secondary roadway to a primary roadway, it would be considered congested because it is expected to operate at a LOS D. According to the ROCOG index of congestion, the LOS C/D boundary is used for primary roadways. Further study of Eastwood Road should be considered to better determine if it is feasible to construct the roadway as a three-lane facility. Also, consideration could be given to preserving right-of-way along Eastwood Road for potential future construction of a three-lane roadway facility.

21.5.4 Road Spacing and Right-of-Way Needs

Table 5-1 in the Traffic Report (Appendix B) is a summary table of typical design guidelines by functional classification. The table provides an indication of spacing between roadways of the same or higher classification. It also provides a range right-of-way requirements for each type of roadway. Based on this table, the proposed 40th Avenue and 20th Street roadway connections would require upwards of 120 feet of right-of-way. This table was developed from guidelines established by several of the counties making up the Twin Cities Metropolitan Area.

21.6 Other Travel Modes

21.6.1 Bike and Pedestrian Travel

The ROCOG travel demand model used to develop the traffic forecasts for this report generates vehicle trips. This means that the trips generated by the model are trips completed by passenger vehicles only. Future pedestrian and bike trips would occur outside of the domain of the forecasting model. Typical rules of thumb state that bike and pedestrian travel make up less than five percent of total vehicle trips made. Because of this, these two modes of travel are not expected to have a direct effect on roadway needs in the project area, but will affect the road right-of-way needs where trails are commonly built. It should be noted however, that the ROCOG Long-Range Transportation Plan provides detail as to the location of existing bike and pedestrian trails as well as the planned location of future trails. Once implemented, these trail extensions would provide an alternative mode of commuter travel as well as act as a recreational amenity.

21.6.2 Transit

Today, two fixed route transit lines serve the AUAR project area. Route 4 travels between the Parkside Store on Marion Road and downtown Rochester. Route 4 buses travel on Park Lane and Marion Road in the project area as far south as the Parkside Store and then travel north out of the project area on 15th Avenue and 6th Street into downtown. Monday through Friday, Route 4 buses operate at half-hour headways during the AM and PM peak periods and at one-hour headways during the midday. Limited service is available on Saturdays. The route serves approximately 340 trips per day on Monday through Friday.

A number of households in the project area were surveyed in 1997 to determine interest in fixed route bus service. The results of the survey indicated a high level of interest in transit service. Based on this survey, Route 17 was established in the project area. Buses on Route 17 travel on TH 14, 50th Avenue (CSAH 11) and Marion Road in the project area. The route operates on Monday through Friday during the AM and PM peak periods. Service is provided at half-hour headways during the AM peak hour and one-hour headways during the PM peak hour. The route serves approximately 80 trips per day.

In 2002, Rochester City Lines will begin work on a 10-Year Transit Plan Update. The update will take six to nine months to complete. As a part of this update, the potential for future transit service enhancements for the AUAR project area will be explored.

22.0 VEHICLE-RELATED AIR EMISSIONS

Estimate the effect of the project's traffic generation on air quality, including carbon monoxide levels. Discuss the effect of traffic improvements or other mitigation measures on air quality impacts. Note: If the project involves 500 or more parking spaces, consult *EAW Guidelines* about whether a detailed air quality analysis is needed.

AUAR Guidance: The guidance provided in "EAW Guidelines: should also be followed for an AUAR. Mitigation proposed to eliminate any potential problems may be presented under item 21 and merely referenced here. The MPCA staff should be consulted regarding possible ISP requirements for certain proposed developments; although the RGU may not want to assume responsibility for applying for an ISP for specific developments, it may be desirable to coordinate the AUAR and ISP analyses closely.

A microscale analysis was performed to evaluate the air quality affect of the Marion Road Trunk Sanitary Sewer Project hypothetical development scenario at the intersection of TH 14 and Marion Road. A mobile source microscale analysis focuses on the impacts of motor vehicles at intersections. This analysis considers CO. Since CO is emitted at greater levels during the idle mode, and acceleration and deceleration modes, CO concentrations are generally highest around intersections. Microscale looks at a smaller area of impact (the interesection), as opposed to a mesoscale analysis which focuses on the emissions of motor vehicle over a much larger area. This intersection was selected for evaluation because traffic modeling indicated that it would be most impacted by development in the area, resulting in the greatest potential for congestion. The study was designed to evaluate concentrations of CO near this intersection for comparison to state and federal air quality standards.

22.1 Microscale Analysis

The microscale analysis was conducted to evaluate the effect of project area traffic on CO concentrations at sensitive receptors, both with (the build case) and without (the no build case) the implementation of the hypothetical development scenario. Since CO emissions from motor vehicles are greatest during the idling, and acceleration and deceleration operating modes, sensitive receptors are located in close proximity to the intersection being evaluated.

Carbon Monoxide is used in microscale studies to indicate roadway pollutant levels since it is the most abundant pollutant emitted by motor vehicles and can result in, so called, “hot spot” (high concentration) locations around congested intersections. State and Federal Ambient Air Quality Standards have been established for CO to protect the public health (known as primary standards). The federal standards do not allow ambient CO concentrations to exceed 35 parts per million (ppm) for a one-hour averaging period and 9 ppm for an eight-hour averaging period, more than once per year at any location. State standards are somewhat more stringent and restrict ambient levels to 30 ppm and 9 ppm for the one-hour and eight-hour averaging periods, respectively. Air quality modeling techniques (computer simulation programs) are used to predict CO levels for both existing and future conditions.

The objective of the microscale analysis is to determine compliance with the State and National Ambient Air Quality Standards established for CO assuming full development with construction of the project. This involves a demonstration that the project will not cause an exceedance of a standard at locations currently attaining standards, as well as a demonstration that the project will not degrade air quality levels at locations where existing air quality exceeds CO standards, if any such locations are predicted to occur.

22.1.1 Intersections/Sensitive Receptors Modeled

Based on the traffic analysis, the intersection of TH 14 and Marion Road was selected for this analysis because it represented the highest potential for traffic congestion in relation to implementation of the hypothetical development scenario.

Sensitive receptors were located around this intersection, based on the site characteristics and USEPA guidance.¹ Consistent with USEPA guidelines, receptors were situated where maximum ambient CO concentrations are likely to occur (i.e., near intersection vehicle queues) and where the general public is likely to have access (i.e., walkways or sidewalks directly adjacent to roadways). Further, following USEPA guidance, receptors were located 3 meters laterally from each roadway, as “sidewalk” receptors; and then positioned at 3 meters, 25 meters, 50 meters, and 75 meters from the intersection along the “sidewalk”. An additional receptor was also located at 100 meters along the “sidewalk” for the eastbound and westbound approaches (along TH 14). Eight to nine receptors were located as “sidewalk” receptors in each of the four quadrants around the intersection. In all, 33 receptor locations were modeled. For receptors further from the intersection, CO concentration are expected to be lower.

¹ USEPA, Guideline for Modeling Carbon Monoxide from Roadway Intersections, EPA-454/R-92-005, November 1992, pp. 2-1 through 2-4.

22.1.2 Modeling Methodology

Consistent with the traffic analysis, CO concentrations were predicted at sensitive receptor locations for the existing case (2002), the future year (2025) no-build case, and future year (2025) build case with mitigation.

For each case modeled, the USEPA MOBILE5b² and CAL3QHC³ computer programs were used to calculate motor vehicle emissions and CO concentrations at sensitive receptors using peak one-hour traffic data. Emissions data calculated by the MOBILE5b model were based on typical motor vehicle operating characteristics. In addition, a state specific vehicle age registration distribution was used. Defined worst case meteorology of stability class D and a 1.0 meter per second wind speed were used in the CAL3QHC model runs, along with varying wind directions from 10 to 360 degrees at 10 degree intervals.

Peak one-hour traffic volumes and turning movements based on the project's traffic analysis were used to assess one-hour CO concentrations. For the peak eight-hour period, roadway concentrations were calculated using an eight-hour to one-hour ratio (or persistence factor) of 0.70 as recommended by USEPA.⁴ This persistence factor accounts for the variability in meteorology over an eight-hour period as compared to one-hour conditions. Eight-hour concentrations were calculated by multiplying predicted one-hour levels by this persistence factor.

An air quality analysis also requires an estimate of "background" air quality levels, representing the contribution of all sources in the project area less the specific intersection analyzed. Background levels of 3.0 ppm for the peak one-hour and 2.0 ppm for the peak eight-hour were conservatively used for all cases (i.e., 2002 and 2025), based on USEPA guidance.

A detailed description of the microscale analysis technical approach is contained in Appendix C.

22.1.3 Microscale Analysis Results

Maximum predicted one- and eight-hour CO concentrations at the sensitive receptors around the TH 14/Marion Road intersection are summarized in Table 2-17. These values represent the highest expected concentrations as they are predicted during the simultaneous occurrence of defined "worst case" meteorology and peak traffic. The results include the contribution of the intersection and background CO levels.

There were no exceedances of either the one-hour (30 ppm state and 35 ppm federal) or eight-hour (9 ppm both state and federal) CO standards for any case. Maximum one-hour and eight-hour concentrations of 9.7 ppm and 6.7 ppm, respectively, were predicted at receptor R22 for the no build case.

² USEPA, *User's Guide to MOBILE5 (Mobile Source Emissions Factor Model)*, May, 1994.

³ USEPA, *User's Guide to CAL3QHC Version 2.0: A Modeling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections*, EPA-454-94-006, Revised, September 1995.

⁴ USEPA, *Guideline for Modeling Carbon Monoxide from Roadway Intersections*, EPA-454/R-92-005, November 1992, pp. 4-11.

Receptor R22 is located along the south side of the TH 14 eastbound approach, about 165 feet west of Marion Road.

In the future, maximum concentrations of 10.3 ppm (one-hour) and 7.1 ppm (eight-hour) were predicted for the build case at receptor R22. For the no-build case, highest one-hour and eight-hour concentrations of 9.5 ppm and 6.6 ppm were predicted at receptor R23. Like receptor R22, receptor R23 is also located along the south side of the TH 14 eastbound approach. Receptor R23, however, is about 250 feet west of Marion Road.

TABLE 2-17
MAXIMUM PREDICTED AMBIENT CO CONCENTRATIONS (ppm)
AT TH 14/MARION INTERSECTION

Intersection	Receptor	Existing		2025 No Build		2025 Build w/Mitigation	
		1-Hr	8-Hr	1-Hr	8-Hr	1-Hr	8-Hr
TH 14 at Marion Road	R1	5.9	4.0	6.4	4.4	6.4	4.4
	R2	6.3	4.3	6.8	4.7	7.2	4.9
	R3	6.9	4.7	7.0	4.8	8.4	5.8
	R4	5.9	4.0	6.6	4.5	7.1	4.9
	R5	8.2	5.6	8.3	5.7	10.2	7.0
	R6	7.6	5.2	7.8	5.4	8.4	5.8
	R7	5.7	3.9	7.5	5.2	7.4	5.1
	R8	5.0	3.4	6.1	4.2	5.9	4.0
	R9	5.1	3.5	6.1	4.2	6.1	4.2
	R10	5.7	3.9	6.4	4.4	6.7	4.6
	R11	5.5	3.8	6.1	4.2	6.9	4.7
	R12	6.0	4.1	6.6	4.5	7.2	4.9
	R13	7.1	4.9	7.4	5.1	9.9	6.8
	R14	6.3	4.3	6.9	4.7	9.2	6.3
	R15	5.2	3.5	6.4	4.4	8.1	5.6
	R16	4.7	3.2	6.0	4.1	7.3	5.0
	R17	5.4	3.7	6.2	4.2	6.8	4.7
	R18	6.2	4.2	6.6	4.5	8.0	5.5
	R19	6.1	4.2	6.4	4.4	7.6	5.2
	R20	6.9	4.7	7.7	5.3	7.8	5.4
	R21	9.1	6.3	9.2	6.3	10.2	7.0
	R22	9.7	6.7	9.1	6.3	10.3	7.1
	R23	8.0	5.5	9.5	6.6	9.9	6.8
	R24	5.7	3.9	7.5	5.2	8.5	5.9
	R25	5.3	3.6	6.4	4.4	6.7	4.6
	R26	5.9	4.0	6.4	4.4	7.1	4.9
	R27	5.9	4.0	6.0	4.1	7.4	5.1
	R28	5.7	3.9	5.9	4.0	6.8	4.7
	R29	7.0	4.8	7.3	5.0	8.3	5.7
	R30	7.8	5.4	8.1	5.6	8.4	5.8
	R31	6.0	4.1	7.8	5.4	7.8	5.4
	R32	5.3	3.6	6.6	4.5	9.1	6.3
	R33	4.8	3.3	6.1	4.2	8.6	5.9

Note: Bold text indicates maximum one-hour and eight-hour concentrations.

23.0 STATIONARY SOURCE AIR EMISSIONS

AUAR Guidance: This item is not applicable to an AUAR. Any stationary air emissions source large enough to merit environmental review requires individual review.

24.0 ODORS, NOISE, AND DUST

Will the project generate odors, noise or dust during construction or during operation? __Yes __No

If yes, describe sources, characteristics, duration, quantities or intensity and any proposed measures to mitigate adverse impacts. Also identify locations of nearby sensitive receptors and estimate impacts on them. Discuss potential impacts on human health or quality of life. (Note: fugitive dust generated by operations may be discussed at item 23 instead of here.)

AUAR Guidance: Dust, odors, and construction noise need not be addressed in an AUAR, unless there is some unusual reason to do so. The RGU might want to discuss as part of the mitigation plan, however, any dust control or construction noise ordinances in effect. If the area will include or adjoin major noise sources a noise analysis is needed to determine if any noise levels in excess of standards would occur, and if so, to identify appropriate mitigation measures. With respect to traffic-generated noise, the noise analysis should be based on the traffic analysis of item 21.

The *City of Rochester Code of Ordinances* regulates noise and contains Local Industrial Performance Standards that regulate noise. There are not City ordinances for dust or odor control.

A noise analysis was conducted to evaluate traffic-generated noise using traffic analysis data from Item 21. Graphs showing the future sound levels at varying distances from two roadways are included in Appendix C. Two roadway sections were evaluated for vehicle-related noise. The first roadway is 40th Avenue from TH 14 to Eastwood Road and the second is Eastwood Road, just east of Marion Road. These two roadways were selected because they are predicted to carry the highest traffic increase in areas of primarily residential use in the project area and, therefore, could experience the most perceptible traffic noise increase related to sensitive receptors.

The design hour traffic volumes for the year 2025 were used to predict these sound levels. The graphs depict noise level versus distance from the median centerline of a roadway. Two types of noise abatement criteria were evaluated. A dBA is a unit of measure of sound level. The number of decibels is calculated as ten times the base-10 logarithm of the square of the ratio of the mean-square sound pressure (often referred to as frequency weighted), and the reference mean-square sound pressure of 20 μ Pa, the threshold of human hearing. The A-weighting network de-emphasizes the high (6.3 kHz and above) and low (below 1 kHz) frequencies, and emphasizes the frequencies between 1 kHz and 6.3 kHz, in an effort to simulate the relative response of the human ear. The Federal Highway Administration (FHWA) adopted a sound level of 67 dBA, LEQ, for residential areas and 72 dBA, LEQ, for commercial/industrial areas. LEQ is the equivalent steady-state sound level that in a stated period of time contains the same acoustic energy as a time-varying sound level during the same period. Minnesota has adopted daytime sound levels of 65 dBA L_{10} for classification 1 (residential) areas and 70 dBA L_{10} for classification 2 (commercial/industrial) areas. The L_{10} is the sound level exceeded 10 percent of a specific time period. In general, Minnesota's noise abatement criteria are more stringent than FHWA's. Any location along a roadway capacity improvement project that approaches or exceeds these thresholds

should be investigated for feasible and reasonable noise abatement measures in the development of the project.

Table 2-18 summarizes the minimum recommended distances from the centerline of a roadway to any residential receptor to be below the noise abatement criteria. Currently, all residences and businesses are outside the minimum distance from the centerline of 40th Avenue and will be in compliance with federal and state noise abatement requirements. However, Eastwood Road just east of Marion Road has a business and several residences within the minimum distance from the centerline of Eastwood Road are currently out of compliance with federal and state noise requirements. These businesses and residences will continue to be out of compliance with higher traffic levels that will occur as development in the area occurs. Noise walls are sometimes considered as mitigation when a numerous structures are affected. In urban areas noise walls are typically not practical due to the need of affected parties to maintain access points from the main roadway. Therefore, no mitigation is recommended for these structures.

TABLE 2-18

**TRAFFIC NOISE SUMMARY TABLE
Marion Road Trunk Sanitary Sewer Project AUAR**

Noise Abatement Categories	Noise Abatement Criteria	Minimum Distance from Centerline of Road that Residential Noise Criteria are Met	
		40 th Avenue	Eastwood Road
Federal - Land Use Category B	67 dBA (Leq)	66 ft.	62 ft.
Minnesota - Classification 1 (Daytime)	65 dBA (L ₁₀)	122 ft.	122 ft.
Minnesota - Classification 2 (Daytime)	70 dBA (L ₁₀)	57 ft.	54 ft.

25.0 NEARBY RESOURCES

Are Any of the Following Resources on or in Proximity to the Site?

- a. Archaeological, historical or architectural resources? ☒ Yes ☐ No
- b. Prime or unique farmlands or land within an agricultural preserve? ☒ Yes ☐ No
- c. Designated parks, recreation areas or trails? ☒ Yes ☐ No
- d. Scenic views and vistas? ☒ Yes ☐ No
- e. Other unique resources? ☒ Yes ☐ No

If yes, describe the resource and identify any project-related impacts on the resource. Describe any measures to minimize or avoid adverse impacts.

25.a.1 Archeological, Historic, and Architectural Resources

AUAR Guidance: For an AUAR, contact with the State Historic Preservation Office is required to determine whether there are areas of potential impacts to these resources. If any exist, an appropriate site survey of high probability areas is needed to address the issue in more detail. The mitigation plan must include mitigation for any impacts identified.

The 106 Group, Ltd., a consulting firm that specializes in cultural resource evaluations, conducted a preliminary cultural resources review of the project area. This review included a preliminary cultural resource evaluation for archaeological, historical, and architectural resources for the AUAR project area. This work included a records search to identify recorded cultural resource sites already known to exist and a “windshield survey” of the project area to identify areas with the potential for intact cultural resources. In addition, a coordination letter was sent to the State Historic Preservation Office (SHPO) on December 20, 2001, and the response is included in Appendix D.

Archaeologists identified areas with a high or moderate potential for archaeological resources based on their topographic location, proximity to water resources, and relative lack of site disturbance. Three types of archaeological resource areas were mapped: one recorded archaeological site, an area of moderate archaeological potential, and two areas of high archaeological potential. Areas of potential historical and architectural significance were also identified (Figure 1-7). The majority of the project area is considered to exhibit low archaeological potential based on topography, disturbances by residential homes, recent development, agriculture, and the presence of wetlands. The City will require that developers coordinate with the SHPO prior to developing any of the areas identified as having a high or moderate potential for intact archaeological resources or having historic or architectural significance. This may include a Phase I archaeological survey and/or historic and architectural assessment prior to development. It is important to consider for scheduling purposes that spring and fall are the optimal times for Phase I cultural resource surveys.

One area considered to exhibit moderate potential for intact archaeological resources is a relatively undisturbed area of higher elevation to the east of Hilltop Avenue. The area begins in a small wooded area that begins directly adjacent to and runs the full length of Hilltop Avenue, then extends 1.5 to 2 miles to the north and east. As this area extends to the east, the woods become interspersed with cornfields. The area is a significant distance from a waterway and therefore was ranked as having only moderate potential for intact archaeological resources.

Two other areas were considered to exhibit high potential for intact archaeological resources. The first of these is the undisturbed wooded area that surrounds a large segment of Bear Creek to the south of the previously described hilltop. Bear Creek is a sizeable tributary of the Zumbro River, and along segments of the creek, archaeological sites have been previously recorded close to the project area. The combination of the previous discovery of archaeological sites along the this waterway and the low level of disturbance suggests a high potential to find intact archaeological resources within 500 feet of this portion of Bear Creek.

A large segment of Badger Run exhibits high potential for intact archaeological resources. This area, which is south of the Bear Creek area, is surrounded by agricultural fields and residences, but is itself undisturbed. The proximity of Badger Run to Bear Creek, its perennial nature, and the lack of

disturbance in the wooded area make this area within 500 feet of Badger Run one with a high potential for intact archaeological resources.

One recorded archaeological site, the Trapp Mounds, has been recorded on the former farmstead of Mr. Leslie Trapp, located along Highway 14 in the SW $\frac{1}{4}$ of Section 4, T106N, R13W (Wilford 1944; Oothoudt 1976). A memorandum (Wilford 1944) attached to a set of miscellaneous notes (Oothoudt 1976) contained in the SHPO files pertains to this area; however, these mounds may not exist. There is a prominent ridge behind the Trapp farmhouse, but no obvious earthworks are on it. Two circular spots that have some prominence are very low for mounds. Though the existence of the Trapp Mounds is suspect, the Minnesota Private Cemeteries Act, which prohibits the disturbance of burials, and the significance attributed to the mounds by the Native American groups require that the possible existence of the mounds be further explored. This would need to be accomplished by developers prior to development.

The project area contains several structures that were determined to be older than 50 years and may have some historic architectural significance. One property within the project area was previously recorded on a statewide architectural survey conducted in the 1970's. This property is the Marion Town Hall located in the SW $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 22, T106N, R13W (OL-MAR-003). The inventory form noted that the structure might have been moved from an earlier location about 1.5 miles north. If it were confirmed that the property has been moved, the building would be considered not eligible for listing on the National Register of Historic Places (NRHP), unless it has extraordinary significance. Approximately seven residences in the Homewood Addition dating to the early twentieth century are within the project area and retain good historical integrity. Also, two tourist cabin-lodging establishments are located within the project area on the south side of Marion Road in Sections 7 and 17. The Marvale Subdivision, a development of more than 50 post-World War II residences on four streets, is located in the western portion of the project area.

25.b.1 Prime or Unique Farmlands

AUAR Guidance: The extent of conversion of existing farmlands anticipated in the AUAR should be described. If any farmland will be preserved by special protection programs, this should be discussed.

The project area contains agricultural lands that are generally not contiguous. Their economic land values do not support continued agricultural practices when compared to development opportunities. Additionally, it is within the policy framework of both Olmsted County and the City of Rochester to support urban development within close proximity to the City of Rochester, thus preventing urban sprawl and the continued depletion of agricultural lands in Olmsted County. The project area is not within the resource (agricultural) protection areas identified in the *Olmsted County General Land Use Plan*.

25.c.1 Designated Parks, Recreation Areas, or Trails

AUAR Guidance: If development of the AUAR will interfere or change the use of any existing such resource, this should be described in the AUAR. The RGU may also want to discuss under this item any proposed parks, recreation areas, or trails to be developed in conjunction with development of the AUAR area.

The hypothetical development scenario will not interfere with or change the use of any existing park, recreation, or trail resources. There are three proposed parks (as identified in the City's *Parkland Acquisition Plan*) within the project area. Individual developments are required by the *City of Rochester Code of Ordinances* to dedicate neighborhood or community parks as part of their development plans. Individual developments can also establish trail connections that link new developments with the City of Rochester trail system and other residential neighborhoods. Potential environmental corridors along major natural features that are un-developable present additional trail corridor opportunities, but there are no specific plans for the extension of the City's trail system along these corridors at this time.

25.d.1 Scenic Views and Vistas

AUAR Guidance: Any impacts on such resources present in the AUAR should be addressed. This would include both direct physical impacts and impacts on visual quality or integrity. "EAW Guidelines: contains a list of possible scenic resources (page 20).

The topographic high areas within the project area provide opportunities for panoramic views of the valleys and associated stream corridors. As development occurs, some of these vistas may be affected by homes or other buildings blocking desirable views. Also, structures adjacent to steep slopes will be very visible from low-lying areas.

25.e.1 Other Unique Resources

A property owner that lives along Marion Road has provided information on the Quarve quarry. He has indicated that the quarry contains museum quality fossils. This information will be provided to existing property owners, any future developers expressing interest in the area, and the Rochester Parks and Recreation Department.

26.0 VISUAL IMPACTS

Will the project create adverse visual impacts during construction or operation? Such as glare from intense lights, lights visible in wilderness areas and large visible plumes from cooling towers or exhaust stacks? ☐ Yes ☒ No

If yes, explain.

AUAR Guidance: If any non-routine visual impacts would occur from the anticipated development, this should be discussed here along with appropriate mitigation.

27.0 COMPATIBILITY WITH PLANS

Is the project subject to an adopted local comprehensive plan, land use plan or regulation, or other applicable land use, water, or resource management plan of a local, regional, state or federal agency? ☒ Yes ☐ No.

If yes, describe the plan, discuss its compatibility with the project and explain how any conflicts will be resolved. If no, explain.

AUAR Guidance: The AUAR must include a statement of certification from the RGU that its comprehensive plan complies with the requirements set out at 4410.3610, subpart 1. The AUAR document should discuss the proposed AUAR area development in the context of the comprehensive plan. If this has not been done as part of the responses to items 6,9,18,21, and others, it must be addressed here; a brief synopsis should be presented here if the material has been presented in detail under other items. Necessary amendments to comprehensive plan elements to allow for any of the development scenarios should be noted. If there are any management plans of any other local, state, or federal agencies applicable to the AUAR area, the document must discuss the compatibility of the plan with the various development scenarios studied, with emphasis on any incompatible elements.

The project area is evaluated based on a development scenario that is consistent with the *City of Rochester Land Use Plan*. The City of Rochester maintains extraterritorial review authority over USAs/URAs within the project area and therefore currently exercises its land use plan policies and current zoning and subdivision regulations upon annexation to the City. Other plan documents that support satisfaction of Minnesota Rule 4410.3610 subpart 1 are certified in a memorandum to John Larsen and Gregg Downing of the EQB from Phil Wheeler, Executive Director of the Rochester-Olmsted County Planning Department dated May 30, 2001, and attached as Appendix F. A follow up meeting with the EQB was held on Tuesday, July 17, 2001, to verify that the documents satisfy the statutory requirements to complete an AUAR. The meeting summary is attached as Appendix F.

No amendments to any plans have been made to allow for the hypothetical development scenario. County management plans that would be applied in cases of interim development are also compatible with the hypothetical development scenario as outlined in the Wheeler memorandum and throughout this document. No other local, state, or federal agency management plans were found to be incompatible with the development scenario.

28.0 IMPACT ON INFRASTRUCTURE AND PUBLIC SERVICES

Will new or expanded utilities, roads, other infrastructure or public services be required to serve the project? ☒ Yes ☐ No.

If yes, describe the new or additional infrastructure or services needed. (Note: any infrastructure that is a connected action with respect to the project must be assessed in the EAW; see *EAW Guidelines* for details.)

AUAR Guidance: This item should first of all summarize information on physical infrastructure presented under items (such 6, 17, 18 and 21). Other major infrastructure or public services not covered under other items should be discussed as well - this includes major social services such as schools,

police, fire, etc. The RGU must be careful to include project-associated infrastructure as an explicit part of the AUAR review if it is to exempt from project-specific review in the future.

28.1 Transportation

The following is a list of the improvements and mitigation measures identified to eliminate the key roadway and intersection deficiencies for the year 2025 development scenario:

Roadway and Intersection Improvements

Improvements are enhancements recommended under the 2025 no-development scenario:

1. Reconstruct the TH 14/Marion Road intersection to accommodate dual left turns, two through lanes, and a right turn lane on all approaches.
2. Install a traffic signal at the Marion Road/Eastwood Road intersection. Along with installing a traffic signal at the Marion Road/Eastwood Road intersection, the relocation of the Eastwood Road approach to approximately 600 feet to the south of its existing location should be considered even though it is not required. Doing this would allow the intersection to meet Mn/DOT's recommended minimum spacing guidelines between signalized intersections and to provide adequate distance between intersections such that the zones of influence that effect drivers do not overlap (see Section 3.2.1 in Appendix B for more information).
3. Construct TH 14 as a four-lane expressway east of 40th Avenue through the 50th Avenue intersection. Also, improve the sight distance on TH 14 at the 40th Avenue intersection by reconstructing the vertical alignment on TH 14 to provide more gradual vertical grade changes near the 40th Avenue intersection.

Roadway and Intersection Mitigations

Mitigations are enhancements recommended under full build out of the 2025 development scenario in order to achieve desired levels-of-service. They would be in addition to the improvements listed above.

1. At the TH 14/40th Avenue intersection:
 - Install a traffic signal with "exclusive" only left turn phasing for all approaches.
 - Construct the south approach to accommodate dual left turn lanes, a through lane, and a right turn lane.
 - Construct the north approach to accommodate a left turn, through, and right turn lane to complement the geometry on the south approach.
2. Construct Marion Road as a four-lane divided roadway between 20th Street and 40th Avenue.

3. If traffic volumes reach a certain trigger, study the possibility of a 20th Street connection between 11th Avenue (CSAH 1) and Marion Road (CSAH 36). It is recommended that a study be conducted before the TH 14/Marion Road intersection exceeds 85 percent of the PM peak hour traffic levels projected in the Year 2025 development scenario. In order to provide enough time for study prior to reaching 85 percent of projected full traffic levels under the development scenario, it is suggested that 70 percent be used as a trigger for studying the feasibility of a new 20th Street connection. In other words, when the TH 14/Marion Road intersection reaches 70 percent of the projected traffic levels under the development scenario, a study of a 20th Street connection should begin. This should provide enough time to determine if 20th Street may be needed before conditions at the TH 14/Marion Road intersection deteriorate below a LOS C.

If the extent of development and traffic growth requires consideration of the 20th St connection, the following ancillary improvements at the Marion Road/20th Street intersection and the Marion Road/40th Avenue intersection should be considered:

Roadway and Intersection Mitigations Needed if New 20th Street Connection is Programmed

1. At the Marion Road/20th Street intersection:
 - Install a traffic signal with “exclusive/permitted” left turn phasing for all approaches.
 - Design Marion Road (north and south approaches) to provide a left-turn lane, two through lanes, and a right-turn lane.
 - Design 20th Street (east and west approaches) to provide a left-turn lane, at least one through lane, and a right-turn lane.
2. At the Marion Road/40th Avenue intersection:
 - Design the 40th Avenue approach to provide a left-turn lane and right-turn lane.
 - Design the Marion Road north approach to provide a left-turn lane and through lane.
 - Design the Marion Road south approach to provide a through lane and right-turn lane.

Possible Bike and Pedestrian Trail Infrastructure

It should be noted that bike and pedestrian trail extensions are being planned for the project area. If implemented, these trail extensions would provide an alternative mode of commuter travel as well as act as a recreational amenity. The ROCOG Long-Range Transportation Plan provides detail as to the location of existing bike and pedestrian trails as well as the planned location of future trails.

Transit Services

1. The City of Rochester tracks performance of its transit routes and decisions regarding the establishment or continuation of service are based on review of fiscal and operating measures and how they compare to established service standards. Decisions to maintain transit service in the study area will be based on the demand for service and whether the service can be provided in a cost-effective manner.
2. Through the ROCOG planning process, consideration should be given to paving shoulders and/or providing bus pull-out areas to serve city and school buses.

28.2 Infrastructure

A 500,000-gallon water tower was constructed in 2001 in the Rose Harbor Area (at the east end of Harbor Heights Court SE) to serve major portions of the project area. The new water tower replaced a nearby 100,000 gallon water tower which previously served only the Rose Harbor and Marvale areas. A 12-inch water main (replacing existing smaller water mains) is being constructed from the new water tower west and south through the Rose Harbor and Marvale areas to the 20th Street SE and Marion Road area and connected to a 16" water main constructed in 2001 along 30th Avenue SE between Marion Road and Pinewood Road. The new water tower and water main upgrades will provide service (via these high pressure water mains and planned near-future pressure reducing stations at 20th Street SE and at Pinewood Road SE) to the area east of 30th Avenue SE, and areas south of Pinewood Road above an elevation of 1,090 feet.

As the easterly portions of the project area develop, additional water storage will be required. A water storage reservoir (approximately 1,000,000 gallon capacity) is planned for the hillside across 20th Street SE from the former Boy Scout Camp (Camp Kahler). The reservoir would be connected to the main served from the pressure reducing station on 20th Street SE near Marion Road, and would serve the east and north portions of the project area through a trunk main extending east along 20th Street SE and north along 42nd Avenue SE as this area develops. Some of the lower elevation areas north of TH 14, west of 55th Avenue, and east of the Sunnydale Subdivision could also be served by this reservoir. The reservoir would also serve areas along Marion Road through a trunk main extending south from 20th Street SE along 40th Avenue SE. This main would connect at 30th Street SE and Marion Road with a planned trunk water main extending east from the planned pressure reducing station at 30th Avenue SE along Pinewood Road and 30th Street SE, thereby creating a looped main serving the entire southeast portion of the project area. The RPU anticipates that at least one additional water supply well will be needed to serve the area if full build out occurs.

In order to provide water service to the approximately one square mile area east of 40th Avenue SE and above an elevation of 1,140 feet, a smaller water tower and/or booster station would be required.

Rochester Typical Water Consumption Information (Year-end City-wide 2001 data):

Year-end Residential Customers:	27,589 homes
Population Served (Approximate):	90,000 persons
Average Persons Per Home (Approximate):	3.25 persons/home
Year 2001 Residential Water Sales:	2,134,382,800 gallons (2.134 billion gallons)
Average Daily Customer Water Usage:	212 gallons/home/day
	65gallons/person/day

(RPU uses a 2.25:1 peak day/average day ratio for total water sales - not just residential sales.)

Additional infrastructure will be required to serve the AUAR project area as development occurs and land is converted to urban uses. Sanitary sewer, water main, and, stormwater piping and stormwater sedimentation basins will be required. The specific requirements for stormwater infrastructure are described in Question 17, requirements for sanitary sewer infrastructure are described in Question 18, and Question 13 addresses water use.

28.3 Impact On Rochester Public School District 535

Several nearby public schools serve the project area including Pinewood, Longfellow, Lincoln at Mann, and Franklin Elementary Schools; Willow Creek Middle School; and Mayo High School. Burr Oak Alternative School also serves the project area and is the only school located to the southeast of the City of Rochester and the project area. No public school is physically located within the project area. However, the Faith Christian private school is located within the project area.

The Rochester Public School District periodically conducts long-range planning through a Strategic Facilities Task Force. The most recent planning available for review is the July 2000 report. This report analyzes school facility needs to 2010. It projects enrollment based on historical enrollment trends and on birth rate trends in the district and not necessarily on projected household growth. Enrollment projections are estimated at 1,000 new students by the year 2010 (it was noted in the report that the task force felt this projection was conservative). This report made several general recommendations for the southern portion of the school district that includes the project area, including recommendations for a new high school by 2008, a new middle school by 2005 to 2007 and a new elementary school in the south portion of the district combined with boundary changes to relieve some of the capacity pressures at Pinewood Elementary (no time frame was estimated for the new elementary school).

The AUAR indicates a total capacity for new development in the project area but does not attempt to project how many units in the project area will develop on an annual basis. However, housing starts have typically been a factor of the market place and throughout the City of Rochester, total permits have ranged between 600 and 800 per year over the last three years. The total number of units projected within the hypothetical development scenario is 6,480, of which 49 percent are expected to be single family. The Rochester-Olmsted Planning Department estimates that each single family home constructed generates 0.83 students. Using this figure, the project area could result in more than 2,600 new students upon complete build out according to the hypothetical development scenario. These 2,600 students will most likely not all come in one year or even within a five-year period.

New growth as a result of development in the project area will be factored into the Rochester School District's facility plans through its strategic long-range planning efforts.

28.4 Emergency Services

No fire stations or other emergency service providers are currently located within the AUAR project area. Current response times for the AUAR project area range from about four to ten minutes. If emergency services continue to be provided as they are currently, it is possible that response times during peak traffic hour congestion would increase if roadway improvements are not made.

29.0 CUMULATIVE IMPACTS

AUAR Guidance: This item does not require a response for an AUAR since the entire AUAR process deals with cumulative impacts from related developments within the AUAR area.

The western portion of the project area contains several small lot developments. The easterly edge of the project area consists of large lot development and open areas. The development pattern and character of

the area will become more urban, affecting the quality of life currently valued by many of the current residents. As development occurs much of the existing vacant and/or open area will be lost. The fairly contiguous habitat corridor along Bear Creek and Badger Run may become more fragmented as development occurs.

30.0 OTHER POTENTIAL ENVIRONMENTAL IMPACTS

If the project may cause any adverse environmental impacts not addressed by items 1 to 28, identify and discuss them here, along with any proposed mitigation.

AUAR Guidance: If applicable, this item should be answered as requested by the EAW form.

None noted.

31.0 SUMMARY OF ISSUES

List any impacts and issues identified above that may require further investigation before the project is begun. Discuss any alternatives or mitigative measures that have been or may be considered for these impacts and issues, including those that have been or may be ordered as permit conditions.

AUAR Guidance: The RGU may answer this question as asked by the form, or instead may choose to provide an Executive Summary to the document that basically covers the same information. Either way, the major emphasis should be on: potentially significant impacts, the differences in impacts between major development scenarios, and the proposed mitigation

Refer to Executive Summary.

RGU CERTIFICATION.

AUAR Guidance: In an AUAR document, no certifications as listed at the end of the EAW form are necessary. (The RGU is legally responsible for the accuracy and completeness of the document and for properly distributing it nonetheless.)

PART III – MARION ROAD TRUNK SANITARY SEWER PROJECT AUAR - MITIGATION PLAN

AUAR Guidance: The final AUAR document must include an explicit mitigation plan. At the RGU's option, a draft plan may be included in the draft AUAR document; of course, whether or not there is a separate item for a draft mitigation plan, proposed mitigation must be addressed through the document.

It must be understood that the mitigation plan in the final document takes on the nature of a commitment by the RGU to prevent potentially significant impacts from occurring from specific projects. It is more than just a list of ways to reduce impacts—it must include information about how the mitigation will be applied and assurance that it will. Otherwise, the AUAR may not be adequate and/or specific projects may lose their exemption from the individual review. The RGU's final action on the AUAR must specifically adopt the mitigation plan; therefore, the plan has a "political" as well as a technical dimension.

1.0 INTRODUCTION

This Mitigation Plan has been prepared to summarize the major components of the AUAR and identify mitigation steps for unacceptable impacts in each issue area. This mitigation plan specifies the mitigation measures, institutional controls, and oversight authority for each feature receiving unacceptable impacts caused by development that is in accordance with the hypothetical development scenario.

To mitigate unacceptable environmental impacts identified in the Marion Road Trunk Sanitary Sewer Project AUAR, the following mitigation measures have been identified. As existing ordinances, plans, and regulations are amended, modified, or replaced, they will be applicable to the AUAR project area. The changes may trigger an AUAR update only if mitigation measures need to be modified as a result of these changes. Plans and policies provide guidance and context for future development that is implemented via ordinances and resolutions adopted by the City Council. In some cases, other jurisdictional units are responsible for implementation of mitigation measures. In such cases, the City will take reasonable and good faith efforts to secure such actions from its governmental counterparts that have the authority and responsibility for implementing noted mitigation measures.

- All permits identified in the AUAR will be secured by the City, or other public or private parties as appropriate, for all development activities within the project area.
- The City will follow the guidance and context in its adopted policies and plans and oversee the implementation of its own regulations as they apply to the review and approval of all development activities within the project area. These items include the *Land Use Plan for the Rochester Urban Service Area* and the *City of Rochester Code of Ordinances*. The City's *Stormwater Management Plan* and *Comprehensive Wetland Management Plan* will be used as technical resources in reviewing development activities. County planning documents will be followed as appropriate for interim development, including the *Olmsted County General Land Use Plan*, the *Olmsted County Zoning Ordinances*, and the *Olmsted County Comprehensive Water Management Plan*.

- The City's extension of sewer and water services will progress consistent with development needs, WQPP guidelines, and this AUAR. Well and septic system construction and abandonment regulations will be followed in the project area.
- The appropriate roadway authority will monitor traffic changes associated with new development within the AUAR project area and will implement improvements identified in this AUAR as dictated by traffic levels.
- The City will require the design and construction of adequate regional and local stormwater ponds and trunk facilities to protect water resources and water quality as required by the *City of Rochester Code of Ordinances*.
- The City will implement a tracking mechanism to monitor development and its conformance with the development scenario.
- Transitional lot size densities consistent with Section 63.111 of the *City of Rochester Code of Ordinances* will be followed for development adjacent to large lot subdivisions.
- The City will implement existing floodplain, wetland, shoreland zoning, and related natural resource regulations per the *City of Rochester Code of Ordinances*. Consideration will also be given to natural communities and Decorah-Edge protection measures during the GDP review process. County planning documents will be followed as appropriate for interim development, including the *Olmsted County General Land Use Plan*, the *Olmsted County Zoning Ordinance*, and the *County Comprehensive Water Management Plan*.
- The City will implement the following stewardship mitigation measures to address the needs of this specific project.
 1. Educate:
 - a. Decision-makers, the development community, local government staff, and citizens on the benefits of and programs available for natural areas conservation and land stewardship.
 - b. Existing landowners prior to the conception of development plans for their land to inform them about alternative development styles and tools available to conserve the natural resources present on their property.
 2. Prepare an Environmental Review Checklist for use by developers to confirm their understanding of the AUAR data, identify the Mitigation Plan measures applicable to their development proposals, and document their developments' consistency with the hypothetical development scenario. In lieu of completing an EAW worksheet, the Checklist will outline natural resource features, mitigation measures, and land stewardship options as part of the General Development Plan review process as a means to encourage developers to fit the subdivision to the land rather than make the land fit the subdivision.

3. Provide the development community, consulting firms, governmental units, and referral agencies with examples of conservation design subdivisions and other stewardship tools along with electronic data (e.g., CDs or ArcIMS access on the Internet) that delineates sensitive areas and links AUAR data and mitigation requirements with parcel base maps for use in project design and review.
4. Update the City of Rochester's *Parkland Acquisition Plan* within the next five years to identify future park needs in the AUAR project area including the identification of floodplains and other natural areas appropriate for public land acquisition in consideration of passive use and environmental corridor development.
5. Update the *Rochester Urban Service Area Land Use Plan Map* to delineate cultural (archaeological, historic, and architectural) sites and environmental corridors located in the recently expanded areas of the City's Urban Service and Urban Reserve Areas by the end of 2004.

2.0 ISSUES AND MITIGATION

This section identifies unacceptable impacts that generated mitigation measures. Table 3-1 presents a summary of mitigation measures that are addressed in this Mitigation Plan.

2.1 General Project Description: Infrastructure (AUAR Item 6)

2.1.1 Sanitary Sewer

The City of Rochester initiated a WQPP to extend sanitary sewer and water to homes with failing and substandard septic systems and wells primarily in areas surrounding the City with near-surface groundwater. Several hundred homeowners near Rochester's southeastern boundary petitioned for this service. The Marion Road Trunk Sanitary Sewer Project was developed in response to the City Council's acceptance of petitions for service to homes in Sewer Service Area 16. Sewer extensions will also serve new developments proposed within Rochester's USAs/URAs in the project area.

The development scenario has been compared to the interceptor/trunk sanitary sewer pipe locations and capacities. The identified trunk and subtrunk sanitary sewer extension improvements are sufficient to accommodate the full development of the Scenario by approximately 2025. Existing and proposed extensions of sanitary sewer are described in the response to Question 6, Section 6.7.1 in Part II of this document.

2.1.2 Municipal Water

Municipal water needs of the development scenario were compared to the capacity of existing and planned facilities. The projected water demand and facility needs are consistent with City plans. New storage facilities and the extension of water service lines is necessary to serve the existing and future development in the project area. The RPU anticipates that an additional well may also be necessary in the project area if full build out occurs.

2.1.3 Stormwater Management

Increased stormwater runoff will result from development. The City's *Stormwater Plan* identifies mitigation methods to maintain pre-development runoff rates to protect water resources and improve water quality. Developers will need to comply with the provisions of *City of Rochester Code of Ordinances* to construct stormwater management facilities or pay for their construction by the City. Additionally, Grading and Erosion Control Plans must be submitted to the Rochester Public Works Department as part of the GDP review process to ensure the adequacy of proposed runoff controls.

The proposed development scenario assumes similar development densities to those used for current stormwater planning, so no changes were required. However, local ponds may need to be constructed for individual developments dependent upon the amount of impervious surface and other site-specific conditions. The installation of trunk storm sewer facilities will need to be coordinated with the timing of development as required by the of *City of Rochester Code of Ordinances*.

2.2 Land Use (AUAR Item 9)

2.2.1 Transitional Lot Size Development Densities

Potential land use conflicts may arise when new development at urban densities is proposed to be built adjacent to existing large lot residential development. The City of Rochester and Olmsted County both have policies within their land use plans that encourage context-sensitive design when planning subdivisions adjacent to existing development. The General Development Plan review enables the City to check for these issues and help guide the development around potential conflicts. In addition, the *City of Rochester Code of Ordinances* contains language that addresses site design policies including a provision (Section 64.111 Minimum Lot Standards) that ensures compatibility between large lot and small lot developments. Enforcement of this zoning code provision is a mitigation strategy.

2.2.2 Development Scenario Tracking Mechanism

The AUAR assumes a hypothetical development scenario. Because it is based on assumptions, it is important that actual development be monitored and compared to the development that was assumed in the development scenario. As mitigation strategy, tracking of this development will be done through the existing GIS system. The developer, as part of the final plat process, will submit electronic plats consistent with County Surveyor requirements in a compatible form to the GIS system. This data will enable the City to maintain an ongoing inventory of platted lots and directly tie building permits to lots so that occupied housing units can be tracked in the development area. The existing GIS system has the capacity to perform this task.

TABLE 3-1

**SUMMARY OF MITIGATION MEASURES
Marion Road Trunk Sanitary Sewer AUAR**

Impacted Feature	Mitigation Measure(s)	Institutional Control	Oversight Authority
Part II, Sections 1 through 8 - No mitigation required.			
LAND USE (Part II, Section 9)			
TRANSITIONAL LOT SIZE/DEVELOPMENT DENSITIES (Potential land use conflicts when new development at urban densities is proposed adjacent to existing large lot residential development.)	Mitigation relates to lot size requirements (development density) that guide compatibility between proposed development adjacent to developed areas.	The City and County have policies that encourage context-sensitive design when planning subdivisions adjacent to existing development: <ul style="list-style-type: none"> • <i>City of Rochester Code of Ordinances</i> (Sec. 64.111) • <i>Olmsted County General Land Use Plan</i> • <i>County Zoning Ordinances</i> 	Rochester- Olmsted Planning Department as part of the General Development Plan review process.
DEVELOPMENT DENSITY	Require developers to submit electronic plats in CAD, Micro Station, GIS or other format compatible with the City's software requirements. City will develop a database that records the number of units (housing units or industrial/commercial square feet) in project area.	Mitigation measure implemented by this AUAR.	Rochester-Olmsted Planning Department as part of the General Development Plan review process.

TABLE 3-1

**SUMMARY OF MITIGATION MEASURES
Marion Road Trunk Sanitary Sewer AUAR**

Impacted Feature	Mitigation Measure(s)	Institutional Control	Oversight Authority
COVER TYPES (Part II, Section 10) Mitigation measures are addressed under other headings where appropriate.			
FISH, WILDLIFE, ECOLOGICAL RESOURCES (Part II, Section 11)			
Blanding's turtle, Blue racer, and black redhorse	The protection, avoidance, minimization, and or mitigation of impacts.	<i>Federal Endangered Species Preservation Act of 1973, as amended in 1978, 1982, and 1988.</i>	U.S. Fish & Wildlife Service (Federal T&E species lead) prior to development.
		<i>Minnesota Statutes Chapter 84.0895 and Minnesota Rules Chapter 6134.</i>	Minnesota Department of Natural Resources Natural Heritage Program (State T&E species lead) prior to development.
		<i>City of Rochester Code of Ordinances.</i>	Rochester-Olmsted Planning Department as part of the General Development Plan review process.
WILDLIFE HABITAT (Woodlands, prairie, grasslands, wetlands, etc.)	The protection, avoidance, minimization, and or mitigation of impacts.	<ul style="list-style-type: none"> <i>City of Rochester Code of Ordinances.</i> <i>Olmsted County General Land Use Plan.</i> 	Rochester-Olmsted Planning Department as part of the General Development Plan review process.

TABLE 3-1
SUMMARY OF MITIGATION MEASURES
Marion Road Trunk Sanitary Sewer Project AUAR

Impacted Feature	Mitigation Measure(s)	Institutional Control	Oversight Authority
WATER USE (Part II, Section 13)			
GROUNDWATER	Replace failing septic systems with City sewer and provide City water in lieu of private wells.	City WQPP to extend sanitary sewer and water service to homes and businesses with failing and substandard septic systems and wells and <i>Rochester Code of Ordinances</i> .	Rochester Public Works as part of the WQPP.
	Abandon wells and septic systems upon connection to City services.	<ul style="list-style-type: none"> All wells or abandoned will follow rules and regulations established by the MDH (<i>Minnesota Rules Chapter 4725</i>). Septic Systems Minnesota Rules Chapter 7080 and Olmsted County Public Health Registration Number 41. 	Rochester-Olmsted Planning Department as part of the WQPP.
	Protection of public water supply.	<i>Wellhead Protection Plan</i> is in preparation for the area.	Rochester Public Utilities Commission (lead) and Minnesota Department of Health; in process.
GROUNDWATER AND SURFACE WATER	Appropriate dewatering methods during construction projects.	Water Appropriation Permit program for dewatering due to shallow groundwater for construction projects if greater than or equal to 10,000 gallons per day or one million gallons per year.	Minnesota Department of Natural Resources prior to dewatering.
	Contracts for public projects will require the investigation and evaluation of potential dewatering impacts to adjacent shallow wells with a requirement to install temporary water service if warranted by impacts.	Project design and contracting processes.	Rochester Public Works as part of the project design and contracting process.

TABLE 3-1
SUMMARY OF MITIGATION MEASURES
Marion Road Trunk Sanitary Sewer Project AUAR

Impacted Feature	Mitigation Measure(s)	Institutional Control	Oversight Authority
PHYSICAL IMPACT ON WATER RESOURCES (Part II, Section 12) and WATER-RELATED LAND USE MANAGEMENT DISTRICT (Part II, Section 14)			
WETLANDS AND THEIR ASSOCIATED SPRINGS AND SEEPS	The protection, avoidance, minimization, and or mitigation of impacts.	U.S. Army Corps of Engineers <i>Section 404 of the Clean Water Act</i> Permits	U.S. Army Corps of Engineers prior to wetland impacts.
		<i>Minnesota Wetland Conservation Act Permits, Letters of Permission and General Permits. (City Stormwater Management Plan and Comprehensive Wetland Management Plan provide technical guidance.)</i>	Olmsted County and City of Rochester Wetland Conservation Act Local Governmental Units prior to wetland impacts.
FLOODWAYS, 100 YEAR FLOODPLAINS, SHORELANDS, AND FLOODPRONE AREAS	The protection, avoidance, minimization, and or mitigation of impacts.	<i>44 CFR 60.22-Floodprone Areas, Part C; Flood Control Permit U.S. Army Corps of Engineers.</i>	U.S. Army Corps of Engineers prior to impacting floodprone areas or floodplains.
		<i>Minnesota Department of Natural Resources Floodplain Management, Protected Water, and Shoreland Programs.</i>	Minnesota Department of Natural Resources prior to impacting floodplain or shoreland.
		<ul style="list-style-type: none"> <i>Olmsted County Floodplain Review.</i> <i>City of Rochester Code of Ordinances. (City Stormwater Management Plan and Comprehensive Wetland Management Plan provide technical guidance.)</i> 	Rochester-Olmsted Planning Department as part of the General Development Plan review process.

TABLE 3-1
SUMMARY OF MITIGATION MEASURES
Marion Road Trunk Sanitary Sewer Project AUAR

Impacted Feature	Mitigation Measure(s)	Institutional Control	Oversight Authority
WATER SURFACE USE (Part II, Section 15) No mitigation required.			
EROSION AND SEDIMENTATION (Part II, Section 16) and WATER QUALITY-SURFACE WATER RUNOFF (Part II, Section 17)			
SOIL EROSION AND SEDIMENTATION, STREAM BANK EROSION	<ul style="list-style-type: none"> Grading and Erosion Control Plan preparation and review, with site inspection for ordinance compliance. Preparation and development of Storm Water Pollution Prevention Program. 	<ul style="list-style-type: none"> <i>City of Rochester Code of Ordinances.</i> NPDES Phase II permit in March 2003. 	<ul style="list-style-type: none"> Rochester Public Works prior to development and during construction. Rochester Public Works and Marion Township in March 2003.
SLOPES (GREATER THAN 18 PERCENT)	Land alteration restrictions.	<i>City of Rochester Code of Ordinances.</i>	Rochester- Olmsted Planning Department as part of the General Development Plan review process.
STORMWATER	<ul style="list-style-type: none"> Install local and regional ponds, sewers, channels, and other BMPS to protect water quality and control discharge rates to pre-development conditions. Develop Storm Water Pollution Prevention Program. 	<ul style="list-style-type: none"> <i>City of Rochester Code of Ordinances. (City of Rochester Stormwater Management Plan and Comprehensive Wetland Management Plan provide technical guidance.)</i> NPDES Phase II permit in March 2003. 	<ul style="list-style-type: none"> Rochester Public Works Department prior to development. Rochester Public Works and Marion Township in March 2003.

TABLE 3-1
SUMMARY OF MITIGATION MEASURES
Marion Road Trunk Sanitary Sewer Project AUAR

Impacted Feature	Mitigation Measure(s)	Institutional Control	Oversight Authority
WATER QUALITY - WASTEWATERS (Part II, Section 18)			
WATER QUALITY	Provision of City sanitary sewer services to subdivisions with failing septic systems and new developments in the AUAR project area.	The WQPP and <i>City of Rochester Code of Ordinances</i> .	City of Rochester Public Work as part of the WQPP.

TABLE 3-1
SUMMARY OF MITIGATION MEASURES
Marion Road Trunk Sanitary Sewer Project AUAR

Impacted Feature	Mitigation Measure(s)	Institutional Control	Oversight Authority
GEOLOGIC HAZARDS AND SOIL CONDITIONS (Part II, Section 19)			
SINKHOLES	Avoid or minimize impact with proper engineering.	<i>City of Rochester Code of Ordinances.</i>	Rochester- Olmsted Planning Department as part of the General Development Plan review process.
SENSITIVITY TO GROUNDWATER CONTAMINATION (Shallow depth to bedrock)	Provide City sewer and water.	The WQPP and the <i>City of Rochester Code of Ordinances.</i>	Rochester Public Works.
	Abandon failing wells and septic systems.	Abandonment and installation of private wells per Minnesota Department of Health (<i>Minnesota Rules Chapter 4725</i>). Septic systems are regulated by <i>Minnesota Rules Chapter 7080</i> and <i>Olmsted County Public Health Regulation No. 41</i> .	Rochester - Olmsted Planning Department.
DECORAH-EDGE	Evaluate Decorah-Edge conditions and application of stewardship mitigation measure.	Stewardship mitigation measures implemented by this AUAR, and substantial land alteration requirements <i>City of Rochester Code of Ordinances Sec. 62.1100</i> .	Rochester - Olmsted Planning Department.
AGGREGATE RESOURCES	Evaluate resource availability and use.	Stewardship mitigation measures implemented by this AUAR.	Rochester - Olmsted Planning Department.

TABLE 3-1
SUMMARY OF MITIGATION MEASURES
Marion Road Trunk Sanitary Sewer Project AUAR

Impacted Feature	Mitigation Measure(s)	Institutional Control	Oversight Authority
SOLID WASTES, HAZARDOUS WASTES, STORAGE TANKS (Part II, Section 20 – No mitigation required.			
TRAFFIC (Part II, Section 21)			
ROADWAY LEVEL OF SERVICE, CAPACITY, SAFETY	Establish Traffic Monitoring Program and apply City of Rochester guidance for Traffic Impact Studies to identify changing conditions warranting initiation of study and project development activities on road extensions, lane additions and signal installations.	<i>MnDOT Work Studies Program, Olmsted County and City of Rochester Capital Improvement Programming, City of Rochester Land Development Manual, ROCOG Long Range Transportation Planning Program.</i>	City of Rochester, Olmsted County, Minnesota Department of Transportation, and ROCOG.
DEFICIENT INTERSECTION OPERATION	Addition of turn lanes and/or installation of traffic signals based on studies determining that warrants for signalization are met and that a traffic signal is the proper solution for the respective traffic deficiency.	<i>Minnesota Manual on Uniform Traffic Control Devices (MMUTCD).</i>	Minnesota Department of Transportation, City of Rochester, and Olmsted County.
INSUFFICIENT PEAK HOUR ROADWAY CAPACITY	<ul style="list-style-type: none"> Consider establishment or enhancement of transit service to reduce peak hour passenger vehicle travel and establishment of bus pull-out areas. Evaluation of roadway upgrade based on traffic monitoring results. 	<ul style="list-style-type: none"> City of Rochester Transit Coordination Program. ROCOG Long Range Transportation Planning Program 	Federal Transit Administration, City of Rochester, Rochester Olmsted Council of Governments, and Minnesota Department of Transportation.
BICYCLE AND PEDESTRIAN USER SAFETY AND MOBILITY	Require trails and sidewalks to be developed with all new roadway and development projects consistent with City and County policy.	City of Rochester and Olmsted County Capital Improvement Programming for trail projects; City of Rochester Land Development Manual, and ROCOG Long Range Bicycle Plan.	City of Rochester, Olmsted County, Rochester Olmsted Council of Governments, Minnesota Department of Transportation, and ROCOG.

TABLE 3-1
SUMMARY OF MITIGATION MEASURES
Marion Road Trunk Sanitary Sewer Project AUAR

Impacted Feature	Mitigation Measure(s)	Institutional Control	Oversight Authority
VEHICLE-RELATED AIR EMISSIONS (Part II, Section 22) and STATIONARY SOURCE AIR EMISSIONS (Part II, Section 23) – No mitigation required.			
ODORS, NOISE, AND DUST (Part II, Section 24) No traffic noise mitigation due to property accessibility needs.			

TABLE 3-1
SUMMARY OF MITIGATION MEASURES
Marion Road Trunk Sanitary Sewer Project AUAR

Impacted Feature	Mitigation Measure(s)	Institutional Control	Oversight Authority
NEARBY RESOURCES (Part II, Section 25)			
PARKS, RECREATION AREAS, OR TRAILS	<p>Consideration of parkland acquisition as noted in the Stewardship mitigation measures identified this table.</p> <ul style="list-style-type: none"> • Dedicating parkland from each development proposal. • Considering dedication of natural resource features. • Updating the <i>Parkland Acquisition Plan</i> within five years to identify future park needs in the AUAR project area, particularly significant segments of environmental corridors with consideration of cooperative purchases. • Updating <i>City Plan</i> map to delineate environmental corridors in the USAs/URAs. 	<i>Land Use Plan for the Rochester Urban Service Area, City of Rochester Code of Ordinances</i> (Section 64.440), and the City of Rochester Park and Recreation Parkland Acquisition Plan.	City of Rochester, Olmsted County, City of Rochester Park Department.
CULTURAL RESOURCES	City will require developer coordination with the State Historic Preservation Officer on properties with recorded high and moderate potential for cultural resources and sites with potential historical or architectural significance.	<i>Section 106 of the Historic Preservation Act, Minnesota Private Cemeteries Act, City Adoption of AUAR and Mitigation Plan.</i>	Rochester - Olmsted Planning Department. State Historic Preservation Officer.

TABLE 3-1
SUMMARY OF MITIGATION MEASURES
Marion Road Trunk Sanitary Sewer Project AUAR

Impacted Feature	Mitigation Measure(s)	Institutional Control	Oversight Authority
Visual Impacts (Part II, Section 26) and Compatibility with Plans (Part II, Section 27) – No mitigation required.			
IMPACT ON INFRASTRUCTURE AND PUBLIC SERVICES (Part II, Section 28)			
INFRASTRUCTURE AND PUBLIC SERVICES.	Infrastructure improvements as identified in this AUAR.	<i>City of Rochester Code of Ordinances, Thoroughfare Plan</i> by Rochester Olmsted Council of Governments, and Minnesota Department of Transportation planning.	City of Rochester, Rochester Olmsted Council of Governments, Olmsted County, and Minnesota Department of Transportation.
CUMULATIVE IMPACTS (Part II, Section 29)			
DEVELOPMENT PATTERN (Development pattern and character of the area will become more urban and may affect the quality of life currently valued by many of the current residents. Vacant and/or open areas will become developed.) HABITAT CORRIDOR (The fairly contiguous habitat corridor along Bear Creek and Badger Run may become more fragmented as development occurs.)	Implementation of the measures identified in this table.	City Adoption of AUAR and Mitigation Plan.	Responsible parties as identified in this table.

TABLE 3-1
SUMMARY OF MITIGATION MEASURES
Marion Road Trunk Sanitary Sewer Project AUAR

Impacted Feature	Mitigation Measure(s)	Institutional Control	Oversight Authority
STEWARDSHIP ITEMS			
NATURAL AND CULTURAL RESOURCES	Educate the community at large on benefits of environmental stewardship and share AUAR resource data with landowners of undeveloped land.	City Adoption of AUAR and Mitigation Plan.	Rochester- Olmsted Planning Department.
	Completion of an Environmental Resource Checklist by developers to confirm understanding of AUAR data, identify applicable mitigation measures, document consistency with hypothetical development scenario, and raise awareness of stewardship opportunities.	City Adoption of AUAR and Mitigation Plan.	Rochester- Olmsted Planning Department.
	Data transfer to provide stewardship information and AUAR resource data to entities involved in the development process.	City Adoption of AUAR and Mitigation Plan.	Rochester- Olmsted Planning Department
	Update <i>Parkland Acquisition Plan</i> to identify areas appropriate for land acquisition.	City Adoption of AUAR and Mitigation Plan and the City of Rochester <i>Parkland Acquisition Plan</i> .	Rochester Park Department
	Update the <i>Rochester USA Land Use Plan Map</i> to delineate cultural resource sites and environmental corridors.	City Adoption of AUAR and Mitigation Plan.	Rochester- Olmsted Planning Department

2.2.3 Parkland

Parkland and recreation areas are considered to be one of the essential services that should be provided in the future USAs/URAs of the City of Rochester. Parkland needs is evaluated on a plat by plat basis. Three primary tools provide direction on how future parkland should be planned: The *City Land Use Plan*, the *City of Rochester Code of Ordinances*, Section 64.440, and the *City of Rochester Parkland Acquisition Plan*. There are a number of general policy questions that affect the entire Rochester USA/URA. Chapter III of the *City Plan* lists specific issue statements to help clarify the interpretation of the Growth Guidelines, some of which deal with the concepts of natural areas conservation and land stewardship. The *Parkland Acquisition Plan* further defines park policies in both an area specific manner and a community wide manner. The following key points are summarized from the three sources listed above.

- It is the intent of the *City Plan* to encourage the acquisition of land for future park development, including neighborhood, community and special parks, as well as environmental corridors.
- Parkland is a desirable element within environmental corridors along rivers and waterways for trail development, including a minimum width of 200 feet where possible.
- Natural resource based parks containing the following resources are encouraged:
 - a. Impounded water areas with potential recreational values encompassing with a minimum of 1.5 acres.
 - b. Sites with unique topographic relief and scenic vistas, with a minimum slope of 20 percent with at least a 100' vertical difference in elevation.
 - c. Wooded areas that would otherwise be denuded with urbanized development including a minimum of ten acres.
 - d. Wetlands of Type 2 and 3 (State and Federal Classification) that could be a value for wildlife and environmental education, with a minimum size of 5 acres.
- In general, parklands should be protected from any type of encroachment, including the construction of buildings, streets, highways, parking lots, utilities, and other structures, consistent with the need to balance recreational and environmental needs with other physical and social needs.

The mitigation will include:

- Dedicating parkland from each development proposal.
- Considering the dedication of natural resource features in lieu of neighborhood parks and recreational fields as a future parkland dedication option.

- Updating the *Parkland Acquisition Plan* within five years to identify future park needs in the AUAR project area and locations appropriate for public land acquisition, particularly significant segments of environmental corridors with consideration given to cooperative purchases.
- Updating the *City Plan* map to delineate environmental corridors in the USAs/URAs that could provide recreational opportunities.

2.3 Fish, Wildlife, and Ecological Resources (AUAR Item 11)

Approximately 72 percent of the project area is presently open lands (agriculture, woodlands, grassland, shrubland, and vacant), wetlands, and floodplains. These areas provide habitat for numerous upland and water-oriented wildlife species. Development within the project area will impact wildlife resources where habitat is lost or altered.

The most significant impact will be caused by the development of open lands that will result in the displacement of habitat area primarily for upland wildlife species. Development will result in an overall loss of habitat quantity, quality, and connectivity in the area. In the short term, animals will be displaced by construction activities, moving into other areas where they will be forced to compete for resources and typically experience higher rates of mortality than resident wildlife. In the long term, the ability of the area to support wildlife will be diminished due to competition for confined habitat areas and the inability to adapt to urban conditions. The frequency of conflicts between humans and wildlife will increase in the form of nuisance wildlife complaints. Also, woodlands will be impacted by construction resulting in tree and undergrowth removal. Lesser development impacts will occur in the areas occupied by wetlands and floodplains because state law and/or City ordinances limit development within these areas.

2.3.1 Environmental Corridors

The *Stormwater Plan* recommends that environmental corridors be established along the Zumbro River and portions of Bear, Willow, Silver, and Cascade Creeks. These corridors could connect existing and proposed parks and would provide a means of joining developing residential areas with recreational areas and other neighborhoods. Since most of the area included in these corridors would be in the floodway, dedication of land for corridor purposes could be accomplished without loss of development value to prospective developers. Such a system would also help to preserve valuable wetland and wildlife habitat and aid in the protection of groundwater recharge areas.

In summary, in order to develop environmental corridors, area-governing bodies may:

- Prepare general development plans for specific areas in advance of development, identifying sites for park acquisition and other public facilities. Such general development plans should be consistent with the *City Plan* and the *Parkland Acquisition Plan*.
- Modify subdivision regulations to facilitate the acquisition of sites for parks other than neighborhood playgrounds or recreational fields.

- Promote the implementation of the environmental corridors concept through cooperative public and/or private efforts to acquire and link sections of the proposed system. The Olmsted County Board has recently authorized the creation of an *Olmsted County Open Space Plan* that could be linked to park development plans in the project area.

2.3.3 Wetland Habitat

See Part III, Section 2.4 Physical Impacts on Water Resources of this document.

2.3.4 Federally Listed Species

A coordination letter was sent to the USFWS. The USFWS response letter (Appendix D) stated that the bald eagle (*Haliaeetus leucocephalus*), Leedy's roseroot (*Sedum integrifolium* spp. *Leedyi*), and prairie bush clover (*Lespedeza leptostachya*) are listed as federally threatened in Minnesota and documented to occur in Olmsted County. However, there are no records indicating that these species occur within the project area. Given the location and type of activity proposed, the USFWS determined that the project is not likely to adversely affect any federally listed or proposed federally threatened or endangered species or adversely modify their critical habitat. This precludes the need for further action on this project as required under *Section 7 of the Endangered Species Act of 1973*.

2.3.5 State Natural Heritage Program

Minnesota's endangered species law (*Minnesota Statutes Chapter 84.0895*) and associated rules (*Chapters 6212.1800 through 6212.2300 and 6134*) impose a variety of restrictions, a permit program, and several exemptions pertaining to species designated as endangered or threatened. The law and rules prohibit taking, importing, transporting, or selling endangered or threatened plants or animals without a permit. "Taking" includes pursuing, capturing, or killing animals or picking, digging, or destroying plants. The law and rules also specify conditions under which the MnDNR may issue permits to allow the taking and possession of endangered or threatened species. When a taking is proposed in conjunction with a development project, the project proposer must explore project alternatives including other locations or designs that would avoid or minimize the taking. If the MnDNR determines that there are no feasible alternatives to the taking in connection with the development project, the applicant must propose compensatory mitigation to reduce the impact to an acceptable level.

There are two natural heritage recorded wildlife species that occur within the project area, the Blanding's turtle (threatened) and the Blue racer (special concern). Also, investigations conducted as part of the *Stormwater Management Plan* identified NHP species associated with Bear Creek and Badger Run that occur in the general project vicinity. Two records of Blanding's turtle (threatened) and two records of Blue racer snakes (special concern) were identified in the vicinity. One record of a Blanding's turtle is shown for the upper portion of Badger Run. The occurrence of the Blanding's turtles is possible along much of Badger Run due to the number of wetlands along the Creek. The black redhorse (fish species of special concern) has been collected from the lower reach of Bear Creek. Within the lower portions of Badger Run, the possible occurrence of the black redhorse would likely be due to the presence of this species in Bear Creek.

2.3.5.1 Endangered and Threatened Species

No state-listed endangered species occur within the project area.

As described above, the Blanding's turtle (*Emydoidea blandingii*) was recorded as occurring at two locations within the project area. The Blanding's turtle is a state-listed threatened species associated with sandy soils and a variety of wetland types. It may also occur along other portions of Badger Run. A species is ranked as threatened if the species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

The preferred habitat of the Blanding's turtle includes calm, shallow water, rich, aquatic vegetation and sand uplands for nesting. Studies by Congdon *et al.* (1983) in Michigan and by Linck in Massachusetts have shown that nesting females may travel considerable distances (200 to 400 meters) to nesting areas, passing enroute what appears to be suitable nesting habitat immediately adjacent to the marsh in which they reside (Coffin and Pfannmuller 1988).

Preferred Habitat

Blanding's turtles need both wetland and upland habitats to complete their life cycle. The types of wetlands used include ponds, marshes, shrub swamps, bogs, and ditches and streams with slow-moving water. In Minnesota, Blanding's turtles are primarily marsh and pond inhabitants. Calm, shallow waterbodies (Type 1 to 3 wetlands) with mud bottoms and abundant aquatic vegetation such as cattails and water lilies are preferred, and extensive marshes bordering rivers provide excellent habitat. Small temporary wetlands that dry up in the late summer or fall are frequently used in the spring and summer. These pools do not harbor fish and are amphibian and invertebrate breeding habitat that provide an important food source for Blanding's turtles. Wetlands with deeper water are needed in times of drought, and during winter. Blanding's turtles overwinter in the muddy bottoms of deeper marshes and ponds, or other water bodies where they are protected from freezing. Blanding's turtles have been known to nest successfully on residential property (especially low density housing situations), and to utilize disturbed areas such as farm fields, gardens, utility corridors, and road rights-of-way. Although turtles travel through woodlots during their seasonal movements, shady areas are not used for nesting.

Impacts, Threats, and Causes of Decline

- Loss of wetland habitat through drainage or flooding to convert wetlands into ponds or lakes.
- Loss of upland habitat through development or conversion to agriculture.
- Human disturbance including illegal collection for pet trade and road kills during seasonal movements.
- Increases in predator populations (skunks, raccoons, etc.) that prey on nests and young.

Recommendations for Avoiding and Minimizing Impacts

In long-lived species, protecting the adults is critical to any conservation strategy. A female turtle may produce as many as 500 eggs during her life. Losing many of these long-lived females, through habitat loss or direct mortality, would seriously jeopardize the ability of a population to maintain itself.

Tables 3-2 and 3-3 provide a summary of recommendations to avoid or minimize impacts to Blanding's turtles adapted from MnDNR guidelines. These recommendations apply to typical construction projects and general land use within Blanding's turtle habitat, and are provided by the MNDNR to help minimize or avoid detrimental impacts to Blanding's turtle populations. Table 3-2 describes minimum measures that are recommended to prevent harm to Blanding's turtles during construction or other work within Blanding's turtle habitat during construction. Table 3-3 contains recommendations that offer greater protection to be used in addition to the first list in areas that are known to be of state-wide importance to the species or in any other area where greater protection is desired. As the AUAR area develops, rural roadways with ditches are less likely to be constructed than more urban curbed roadways. Thus the use of tunnels and curb criteria will be important considerations.

2.3.5.2 Rare and Special Concern Species

The Blue racer snake (*Coluber constrictor*) is a state listed species of special concern that is recorded to occur within the project area. A species is listed as special concern if, although the species is not endangered or threatened, it is extremely uncommon in this state, or has unique or highly specific habitat requirements and deserves careful monitoring of its status. Species on the periphery of their range that are not listed as threatened may be included in this category along with those species that were once threatened or endangered but now have increasing or protected, stable populations.

The Blue racer occupies a variety of habitats in the deciduous forest regions of Minnesota, including forested hillsides, bluff prairies, grasslands, and open woods. Woodland margins and field edges are the preferred summer habitats (Coffin and Pfannmuller 1988). Individuals live in a variety of open dry habitats such as brushy areas along the edges of deciduous woodlands, grass prairies, bluff prairies, and old fields. Because these snakes primarily hunt by sight, they avoid areas of dense vegetation. Racers overwinter in mammal burrows, rock crevices, gravel banks, stone walls, and abandoned wells. They may share these winter homes with other racers, Timber rattlesnakes, Rat snakes, Gopher snakes, and common Garter snakes. The destruction and loss of habitat are the greatest threat to amphibian and reptile populations and is especially critical to rare species. Pesticide accumulation, hunting, and over-collecting also pose a threat.

The black redhorse (fish species of special concern) has been collected from the lower reach of Bear Creek. Within the lower portions of Badger Run, the possible occurrence of the black redhorse would be likely due to the presence of this species in Bear Creek.

As a mitigation strategy, the City of Rochester will educate landowners, developers, and contractors regarding the habitat needs and avoidance, minimization, and mitigation measures that pertain to existing threatened and special concern species as part of an education process.

2.4 Physical Impacts on Water Resources (AUAR Item 12)

Presently, specific development and infrastructure design plans are largely undefined for properties within the project area. The determination of exact boundaries of floodplains, shorelands, and wetlands on properties within the area occurs when development projects are proposed or plans for roadway extensions or modifications or other infrastructure projects are submitted to the City as part of the GDP review process. Thus, specific physical impacts on water resources related to development are not known. Impacts to water resources identified as part of the GDP review process will be addressed on a case-by case basis. The water resources within the project area are Bear Creek, Badger Run, their related floodplains and minor tributaries, and wetlands. Bear Creek and Badger Run are both MnDNR protected waters (Figure 1-5).

2.4.1 Potential Impacts

As the City expands further into its USA/URAs, these waterways may be impacted by development and may be degraded by the changed volume and quality of urban runoff and by the potential alteration of or impacts to floodplains and wetlands. Most underground utility installations that require stream or wetland crossing will be temporary and the resources will typically revert to their pre-construction state. Stormwater runoff is addressed under Question 17. Roadway culvert and/or bridge modifications or additions may occur in the project area. No other impacts to surface water bodies are anticipated.

2.4.2 Protection and Mitigation

Protection and mitigation of potential impacts to water resources include implementation of the following:

U.S. Army Corps of Engineers Section 404 of the Clean Water Act: Establishes a program to regulate the discharge of dredged and fill material into waters of the U.S., including wetlands. Activities in waters of the U.S. that are regulated under this program include fills for development, water resource projects (such as dams and levees), infrastructure development (such as highways), and conversion of wetlands to uplands. Under Section 404 of the CWA, the USEPA and the U.S. Army Corps of Engineers (USACE) regulate the placement of fill into all waters of the U.S. Provisions of Section 404 of the Clean Water Act are implemented by the USACE with guidance and review by the USEPA. The USFWS provide technical oversight as needed.

Minnesota Wetland Conservation Act (WCA): To retain the benefits of wetlands and reach the legislation's goal of no-net-loss of wetlands, the WCA requires anyone proposing to drain or fill a wetland first to try to avoid disturbing the wetland; second, to try to minimize any impact on the wetland; and, finally, to replace any lost wetland acres, functions, and values. Certain wetland activities are exempt from the act, allowing projects with minimal impact or projects located on land where certain pre-established land uses are present to proceed without regulation.

The City developed a *Wetland Plan* to help improve the management of the wetlands in Rochester by prioritizing among wetlands based on their functional values, and by holistically managing the system. The system-wide view of the *Wetland Plan* includes identification of significant wetland corridors and complexes and opportunities for banking and restoration that are not possible under the current piecemeal approach to wetland regulation and management.

TABLE 3-2

RECOMMENDATIONS FOR AREAS INHABITED BY BLANDING’S TURTLES
Marion Road Trunk Sanitary Sewer Project AUAR

GENERAL GUIDELINES	
The MnDNR flyer “Protecting Blanding’s Turtle Nests” with an illustration of a Blanding’s turtle should be given to homeowners and all developers and contractors working in the area.	
Turtles that are in imminent danger should be moved by hand out of harm’s way. Turtles that are not in imminent danger should be left undisturbed.	
If a Blanding’s turtle nests in your yard, do not disturb the nest.	
Silt fencing should be set up to keep turtles out of construction areas, but not restrict connections to their habitat. It is <u>critical</u> that silt fencing be removed after the area has been revegetated.	
WETLANDS	
Small, vegetated temporary wetlands (Types 2 and 3) should not be dredged, deepened, filled, or converted to stormwater retention basins in Blanding’s turtle habitats. These wetlands provide important habitat during spring and summer.	
Wetlands should be protected from pollutions. The use of fertilizers and pesticides should be avoided, and runoff from lawns and streets should be controlled. Erosion should be prevented to keep sediment from reaching wetlands and lakes.	
ROADS	
Roads should be kept to minimum standards on widths and lanes as this reduces road kills by slowing traffic and reducing the distance turtles need to cross.	
Roads should be ditched, not curbed or constructed below grade. If curbs must be used four-inch high curbs at a 3:1 slope are preferred. Blanding’s turtles have great difficulty climbing traditional curbs and below-grade roads trap turtles on the road and can cause road kills.	
Culverts between wetland areas, or between wetland areas and nesting areas, should be 36 inches or more in diameter and elliptical or flat-bottomed.	
Wetland crossings should be bridged, or include raised roadways with culverts that are at least 36 inches in diameter and elliptical or flat-bottomed. Raised roadways discourage turtles from leaving the wetland to bask on roads.	
Culverts under roads used as stream crossings should be oversized at least twice as wide as the normal width of open water and elliptical or flat-bottomed.	
UTILITIES	
Utility access and maintenance roads should be kept to a minimum to reduce road-kill potential.	
Below-ground utility construction sites should be returned to original grade, trenches could trap turtles.	
LANDSCAPING AND VEGETATION MANAGEMENT	
Terrain should be left with as much natural contour and cover as possible.	
Graded areas should be revegetated with native grasses and forbs. Some non-natives form dense patches that hinder turtle movement.	
Vegetation management in infrequently mowed areas, such as in ditches or along utility access roads, and under power lines, should be done mechanically rather than by using chemicals. Work should be done after October 1 and before June 1 and care should be taken while mowing to avoid turtles that may be present.	

TABLE 3-3

**ADDITIONAL RECOMMENDATIONS FOR BLANDING'S TURTLE
STATE-WIDE IMPORTANCE AREAS*
Marion Road Trunk Sanitary Sewer Project AUAR**

GENERAL GUIDELINES	
Turtle crossing signs can be installed adjacent to road crossing areas used by Blanding's turtles to increase public awareness and reduce road kills.	
Workers in the area should be aware that Blanding's turtles nest in June, generally after 4:00 pm, and should be advised to minimize disturbance if turtles are seen.	
Construction in potential nesting areas should be limited to the period between September 15 and June 1 when the activity of adults and hatchlings in upland areas is at a minimum.	
Silt fencing should be set up to keep turtles out of construction areas, but not restrict connections to their habitat. It is <u>critical</u> that silt fencing be removed after the area has been revegetated.	
WETLANDS	
Shallow portions of wetlands should not be disturbed during prime basking time (mid-morning to mid-afternoon in May and June and summer. A wide buffer should be left along the shore to minimize human activity near wetlands. Basking Blanding's turtles are more easily disturbed than other turtle species.	
Wetlands should be protected from road, lawn, and other chemical run-off by a vegetated buffer strip at least 50 feet wide. This buffer should be left unmowed and in a natural condition.	
ROADS	
Tunnels should be considered in areas with concentrations of turtle crossings of more than ten turtles per year per 100 meters of road, and in areas of lower density if the level of road use would make a safe crossing impossible for turtles. The MnDNR Regional Nongame Specialist can provide additional information on wildlife tunnels.	
Roads should be ditched, not curbed or constructed below grade.	
Road placement should avoid separating or bisecting wetlands from adjacent upland nesting sites, or these roads should be fenced to prevent turtles from attempting to cross. Contact MnDNR for detailed information. This is especially important for roads with more than two lanes.	
Roads crossing streams should be bridged as opposed to using culverts.	
LANDSCAPING AND VEGETATION MANAGEMENT	
As much natural landscape as possible should be preserved. The installation of sod or wood chips, paving, and planting of trees within nesting habitat can make that habitat unusable to nesting Blanding's turtles.	
Open space should include some areas at higher elevations for nesting. These areas should be retained in native vegetation, and should be connected to wetlands by a wide corridor of native vegetation.	
Preferentially, ditches and utility access roads should not be mowed or managed through the use of chemicals. If vegetation management is required it should be done mechanically and as infrequently as possible and after October 1 and before June 1 and care should be taken while mowing to avoid turtles that may be present. Mowing can kill turtles present during mowing and makes it easier for predators to locate turtles crossing roads.	

- * No Blanding's turtle statewide importance areas are present in the AUAR project area. This information is included for additional mitigation consideration.

The *Stormwater Management Plan*, written in 1997 and revised in 1999, creates a balance between development and natural resource conservation that meets the needs of individuals, businesses, and the community. The City incorporated much of the *Stormwater Plan* language in the *City of Rochester Code of Ordinances*. Citizens, agencies, developers, and industry work together to implement the *Stormwater Plan* and to collectively manage growth by creating developments that accomplish surface water management goals, including a reduction of physical impacts by controlling runoff to pre-development rates and identifying BMPs for water quality protection.

The *Stormwater Plan* proposes a regional approach for future construction of the City's stormwater drainage system. This approach provides an economic benefit to local developers through the economy of scale involved in larger, more efficient regional facilities and trunk storm sewers to serve upstream drainage areas. This approach also provides an economic benefit to the City by centralizing drainage facilities to reduce operation and maintenance costs. Strategies are needed to plan and guide the expansion of the City's drainage system. These strategies:

- Determine improvements needed to prevent and control potential flood damage.
- Develop standards for the design and construction of storm sewers and flood storage facilities.
- Provide standards for water quality and erosion control practices.
- Analyze capital improvement financing options.
- Provide for identification and management of natural resources.
- Prepare the City for Phase II NPDES Stormwater Permit requirements.
- Provide guidance for the implementation of educational programs.

As part of the *Stormwater Plan*, the City developed the following goals and policies to reduce the pollutant loads from urban runoff, and to reduce the erosion of the City's streams and drainage systems.

Flood Protection

- Adopt stormwater management practices to provide a 100-year rainfall event level of protection.
- Establish allowable elevations for the lowest floors of buildings as follows:
 - a. Two feet above 100-year levels near ponding areas and unmapped floodplains.
 - b. One foot above 100-year levels near mapped floodplains.
 - c. One foot above the emergency overflow outlet for buildings adjacent to ponding areas.

- Regulate development and limit use within the 100-year flood plain to those that are properly flood protected; do not have a detrimental effect on the floodway channel and flood plain storage; and are unharmed by flooding.
- Establish rainfall events as design criteria for the following:
 - a. Storm Drainage System: 100-year rainfall event.
 - b. Storm Sewer System: 10-year rainfall event.
- Upgrade existing storm sewer facilities to a 10-year level of service when practical.
- Establish and maintain overflow routes where possible to provide relief during storm conditions that exceed design conditions.
- Preserve the necessary storage capacities of protected waters and the conveyance capacity of watercourses as defined by the plan.
- Require new development of vacant land and redevelopment of existing sites to conform with the *Stormwater Plan*. As redevelopment or reconstruction of public infrastructure occurs, nonconforming areas shall, where practical, be brought into compliance.

Erosion Control

- Require erosion and sediment control practices on all construction sites.
- Use urban BMPs as described in the *Minnesota Pollution Control Agency Urban BMP Handbook* and the *City of Rochester Erosion Control Standards*.
- Establish an inspection program and enforcement procedure to control erosion on construction sites.
- Establish criteria to regulate runoff velocities and encourage natural cover to reduce erosion.
- Develop a program that encourages conservation practices to be applied to all lands in the upstream watersheds of all reservoirs to slow surface water runoff and reduce the rate of siltation.
- Minimize the impact from developing areas with highly erodible soils.
- Adopt a program for stabilizing stream banks depending on geology, setting, soils conditions and surrounding land use.

Surface Water Quality Protection

- Develop regional water quality treatment facilities with acceptable standards to remove phosphorus, heavy metals and suspended solids.
- Require the construction of water quality devices to maintain the quality of water in downstream water bodies as proposed by the *Stormwater Management Plan*.
- Develop maintenance standards and practices to protect surface water quality, including street sweeping and maintenance of water quality facilities.
- Protect existing wetlands and promote local wetland banking creation and enhancement.
- Maximize the use of City parkland through water quality enhancement projects and demonstrations of effective water quality practices. (i.e., native vegetation along river/stream banks on City property, etc.)
- Regulate design and location of salt or sand/salt storage sites to avoid affecting water wells, lakes, rivers, streams, groundwater recharge areas, and floodprone areas. Identify feasible improvements in developed areas that will improve surface water quality.

Minnesota Department of Natural Resources Protected Waters Program include all Type 3, 4, and 5 wetlands (as defined in USFWS Circular No. 39, 1971 ed.) that are 10 acres or more in size in unincorporated areas or 2½ acres or more in size in incorporated areas (see Minnesota Statutes Section 103G.005, subd. 17b, Wetland Type). The project area does not include any MnDNR protected wetlands. However, Bear Creek and Badger Run are MnDNR Protected Waters.

Minnesota Department of Natural Resources State Floodplain Management Act (Minnesota Statutes, Chapter 103F) promulgates minimum standards for floodplain management entitled “Statewide Standards and Criteria for Management of Flood Plain Areas of Minnesota” (Minn. Rules 6120.5000 - 6120.6200). These standards have two direct applications: 1) all local floodplain regulations adopted after June 30, 1970, must be compliant with these standards; and 2) all state agencies and local units of government must comply with Minnesota Regulations in the construction of structures, roads, bridges or other facilities located within floodplain areas delineated by local ordinance. Local floodplain regulatory programs, administered by county government, predominately for the unincorporated areas of a county, and by municipal government for the incorporated areas of a county, must be compliant with federal and state floodplain management standards. Both federal and state standards identify the 100-year floodplain as the minimum area necessary for regulation at the local level. These regulations are intended to protect new development and modifications to existing development from flood damages when locating in a flood prone area cannot be avoided.

The *City of Rochester Code of Ordinances* provides tools to effect the implementation of water resource conservation and land stewardship concepts. These include regulations prohibiting development in the floodway; requiring conditional use permits for development in the 100-year floodplain, and guiding potential development in shorelands, wetlands, and blufflands areas. The *Rochester Code of Ordinances* also provides restrictions on substantial terrain alterations. Density bonuses are available to developers who avoid disturbing natural features and provisions are made for cluster subdivisions.

The City of Rochester also currently requires developers to implement erosion and sediment control measures during development. The *City of Rochester Code of Ordinances* requires new developments to prepare site grading and erosion control plans that undergo review by a City Engineer. Plans typically identify control measures such as temporary sedimentation basins, bale checks, and silt fences to be used during construction and permanent sedimentation basins for post-construction stormwater control. Other references regarding erosion and sedimentation control guidance that are often included in the grading and erosion control plans are extracted from *MPCA Best Management Practices for Protecting Water Quality in Urban Areas* and the *BWSR Minnesota Construction Site Erosion and Sediment Control Planning Handbook*. National Pollutant Discharge Elimination System Phase 2 regulations will be applicable to most of the development that will occur in the project area as of March 2003.

The City of Rochester will be subject to *NPDES Phase II Permit Program* in March 2003, which will institute further requirements for protecting receiving waters from urban runoff.

If or when required by the MPCA in the future, Marion Township will also be responsible for implementing storm water management requirements in the Marion Township areas adjacent to the AUAR project area.

If the interim development option is chosen within the project area, the *Olmsted County Zoning Ordinance* will serve as the implementation tool for the *County Plan*. Regulations covering the development of such sensitive areas as floodways, floodplains, shorelands, wetlands, and blufflands have been in place for a number of years. The *Olmsted County Zoning Ordinance* also has provisions covering soil erosion control measures to help prevent sedimentation in area waterways.

2.5 Water Use (AUAR Item 13)

Water lines will be extended into the project area. It is anticipated that hundreds of wells will be abandoned. The City water quantities to be supplied to the project area will initially correlate directly with the current pumping capacities of existing water supply wells and ultimately grow to serve the anticipated development within the area. All wells that are abandoned when City water service is initiated are required to follow rules and regulations established by Minnesota Department of Health (MDH), Minnesota Statutes Chapter 103I and Minnesota Rules Chapter 4725.3850. Any wells retained for private non-domestic use will require a well maintenance permit from the ROPD, must meet water quality standards and cannot be connected to the City water system. Interim development projects may install private wells.

The City of Rochester is currently in the process of developing a wellhead protection plan. Areas that directly impact the groundwater used for domestic consumption will be considered as wellhead protection areas. Well 72 and portions of the DWSMAs associated with this well and Wells 21 and 33 are located within the project area.

A 500,000-gallon water tower was constructed in 2001 in the Rose Harbor Area (at the east end of Harbor Heights Court SE) to serve major portions of the project area. The new water tower replaced a nearby 100,000 gallon water tower which previously served only the Rose Harbor and Marvale areas. A 12-inch water main (replacing existing smaller water mains) is being constructed from the new water tower west and south through the Rose Harbor and Marvale areas to the 20th Street SE and Marion Road area and connected to a 16" water main constructed in 2001 along 30th Avenue SE between Marion Road and Pinewood Road. The new water tower and water main upgrades will provide service (via these high

pressure water mains and planned near-future pressure reducing stations at 20th Street SE and at Pinewood Road SE) to the area east of 30th Avenue SE, and areas south of Pinewood Road above an elevation of 1,090 feet.

As the easterly portions of the project area develop, additional water storage will be required. A water storage reservoir (approximately 1,000,000 gallon capacity) is planned for the hillside across 20th Street SE from the former Boy Scout Camp (Camp Kahler). The reservoir would be connected to the main served from the pressure reducing station on 20th Street SE near Marion Road, and would serve the east and north portions of the project area through a trunk main extending east along 20th Street SE and north along 42nd Avenue SE as this area develops. Some of the lower elevation areas north of TH 14, west of 55th Avenue, and east of the Sunnysdale Subdivision could also be served by this reservoir. The reservoir would also serve areas along Marion Road through a trunk main extending south from 20th Street SE along 40th Avenue SE. This main would connect at 30th Street SE and Marion Road with a planned trunk water main extending east from the planned pressure reducing station at 30th Avenue SE along Pinewood Road and 30th Street SE, thereby creating a looped main serving the entire southeast portion of the project area. The RPU anticipates at least one additional water supply well will be needed to serve the area if full build out occurs.

In order to provide water service to the approximately one square mile area east of 40th Avenue SE and above an elevation of 1140 feet, a smaller water tower and/or booster station would be required.

Rochester Typical Water Consumption Information (Year-end City-wide 2001 data):

Year-end Residential Customers:	27,589 homes
Population Served (Approximate):	90,000 persons
Average Persons Per Home (Approximate):	3.25 persons/home
Year 2001 Residential Water Sales:	2,134,382,800 gallons (2.134 billion gallons)
Average Daily Customer Water Usage:	212 gallons/home/day 65gallons/person/day

(RPU uses a 2.25:1 peak day/average day ratio for total water sales – not just residential sales.)

Anticipated development of the area includes the installation of underground infrastructure such as sanitary sewer, water, and storm sewer lines. This infrastructure and other excavation related to development in the area may require dewatering due to shallow depth to groundwater in the area. If of sufficient volume, a *MnDNR Water Appropriation Permit* will be required. Public contracts will require the investigation and evaluation of potential dewatering impacts based on adjacent shallow wells as part of engineering, and contractors may be required to install temporary water service if warranted by impacts.

2.6 Water-related Land Use Management District (AUAR Item 14)

Presently, specific development and infrastructure plans are largely undefined for properties within the project area. As with most areas, the determination of the exact boundaries of floodplains and shorelands on properties within the area occur when development projects are proposed or plans for roadway extensions or modifications or other infrastructure projects are submitted to the City as part of the GDP review process. Thus, specific physical impacts on Water-Related Land Use Management Districts are not known at this time.

Proposed development plans and infrastructure improvements are subject to the following requirements.

- The floodplain provisions of *Chapter 62.800 Flood Districts* of the *City of Rochester Code of Ordinances*.
- *MnDNR Shoreland Zoning* regulations, the *County Zoning Ordinance*, and the *City of Rochester Code of Ordinances* also restrict development within 1000 feet of the ordinary high water mark of lakes and 300 feet of the ordinary high water mark of streams.
- Exceptions to these regulations would require obtaining a conditional use permit from the appropriate agency. Individual development projects will be required to address shoreland regulations

2.7 Erosion and Sediment Control (AUAR Item 16)

The *City of Rochester Code of Ordinances* regulates development on bluffs and steep slopes. Bluffs are typically considered to consist of slopes greater than 18 percent and steep slopes are typically those with slopes greater than 12 percent and less than 18 percent. Development is not recommended or is described as poorly suited on steep slopes and not allowed within a specified distance from bluffs unless appropriate design or construction methods are approved. Revegetation and screening requirements also apply to these areas.

Section 62.1101 of the City of Rochester Code of Ordinances addresses excavation activities, temporary sedimentation control, and substantial land alteration. This ordinance requires erosion control and grading plan review, as well as a site inspection for compliance with the ordinance.

Erosion control for sites greater than one acre is one of the six minimum control measures required under the forthcoming *NPDES Phase II* permit in March 2003.

2.8 Water Quality-Surface Water Runoff (AUAR Item 17)

Please refer to Part III, Section 2.4 Physical Impacts on Water Resources.

2.9 Water Quality

2.9.1 Water Quality Protection Program: Sewer Installation and Septic System Abandonment

The City has initiated a WQPP to extend sanitary sewer and water to homes in the project area with failing and substandard septic systems and wells primarily in areas with near-surface groundwater. As individual septic systems fail, users must have access to alternate means of wastewater disposal. Proper abandonment of individual septic systems is a condition of connection to City sewer under the WQPP. The sewer extension will also serve new development in the project area. Please refer to Part II, Wastewaters (AUAR Item 18). The *Wastewater Master Plan*, completed by the City of Rochester in 1996, contains specific recommendations relative to providing wastewater collection service to the project area. All treatment of wastewater generated in the project area under the development scenario will occur at the RWRP.

2.9.2 Provision Of City Water and Abandonment Of Private Wells

Water lines will be extended into the project area. It is anticipated that hundreds of wells will be abandoned. All wells that are abandoned when City water service is initiated are required to follow rules and regulations established by MDH, Minnesota Statutes Chapter 103I and Minnesota Rules Chapter 4725.3850. Any wells retained for private non-domestic use will require a well maintenance permit from the ROPD, must meet water quality standards and cannot be connected to the City water system. Interim development projects may install private wells and septic systems.

The City of Rochester is currently in the process of developing a wellhead protection plan. Areas that directly impact the groundwater used for domestic consumption will be some of the areas considered for wellhead protection areas. Well 72 and portions of the DWSMAs associated with this well and Wells 21 and 33 are located within the project area.

2.9.3 Sinkholes

The *Olmsted County Zoning Ordinance* identifies sinkholes and other karst features as special areas. Surface water runoff and artificial surface drainage cannot be directed into visible karst features, such as sinkholes. Also, sinkholes pose a constructability issue that would require avoidance or the development of acceptable construction methods as part of the General Development Plan review process.

2.9.4 Decorah-Edge

A report from the Olmsted County Environmental Resources Department gives several recommendations for possible protection and mitigation of potential impacts to areas near the Decorah geologic formation, an area that supplies nearly half of the groundwater recharge for City wells. They include the following:

- Develop a groundwater recharge overlay zoning district for the area within the City of Rochester where the Decorah shale is the first encountered bedrock.
- Designate the overlay district as a high priority area for wetland preservation, enhancement, and restoration. This designation would recognize that the groundwater recharge benefits of wetlands lost to development in this area couldn't be mitigated by replacement in other areas.
- Encourage the development of transportation and utility corridors on nose slopes rather than head slopes. Both slopes may have natural grades amendable to use as transportation corridors, but there is considerably less groundwater recharge on nose slopes.
- Preserve these corridors by limiting regrading and mining of the St. Peter sandstone at the base of the slope.
- Adopt standards for the design and construction of stormwater management structures in head slope areas that utilize the differing hydrogeological characteristics of the bedrock layers and preserve unique hydric features. Head slopes concentrate both groundwater recharge and surface drainage creating springs, seeps and wetlands.

- Develop an educational program that summarizes the basic concepts of the recharge processes that occur at the Decorah-Edge and emphasizes the importance of this area for drinking water protection.

These recommendations have not been adopted by Olmsted County or the City of Rochester, but concerns associated with this geologic feature are given consideration during the General Development Plan review process.

2.10 Traffic (AUAR Item 21)

2.10.1 Road Improvements/Mitigations

The principal recommendation of the AUAR related to Road Improvements and Mitigation is to establish a traffic monitoring program that will ensure a proactive approach to the planning and programming of traffic improvements in the study area as future development and traffic growth occurs. The City of Rochester will undertake a bi-annual monitoring program at a list of locations identified in Appendix B to determine when traffic thresholds indicating a high likelihood of deficient operation are being approached, so that initiation of study, project development and programming can proceed. Given that multiple roadway authorities are responsible for major corridors in the study area (MNDOT for TH 14, Olmsted County for Marion Road, CR 11 and Eastwood Road), a cooperative effort will be required to insure that improvements are identified in a timely manner and programming of funds initiated. If the city receives a request for a large development occurring in the interval between monitoring years, a Traffic Impact Study, consistent with the requirements of the City of Rochester, will be required to assess the impact of the development on study area streets in the immediate area of the development. The City of Rochester will administer its Substandard Street Policy in the study area and will establish a Transportation Improvement District account as a tool to collect funds for the future improvements of roadways that are determined to be impacted by traffic generated by new development in the area.

Under the Development Scenario that has been defined, a number of Improvements and Mitigations have been identified that would be needed to accommodate full build out of the development scenario. These improvements are identified in Table 3-4. All improvements are consistent with the Long Range Thoroughfare Plan for the Rochester area. It is anticipated that implementation of projects will follow standard project development, programming and contracting procedures involving, as necessary, MNDOT and Olmsted County. The City will be proactive in encouraging the timely implementation of improvements with its partners, based on the monitoring program to be implemented. Studies of the Marion Road and TH 14 intersection, the TH 14 corridor east of 40th Avenue, and Eastwood Road have already been initiated based on current or expected short term traffic conditions on TH 14 and Eastwood Road.

TABLE 3-4

**ROADWAY IMPROVEMENT AND MITIGATION SUMMARY
Marion Road Trunk Sanitary Sewer Project AUAR**

Location	Improvement/Mitigation	Improvement Identified under the 2025 No Development and Development Scenarios	Mitigation Measure identified under the 2025 Development Scenario Only
TH 14/Marion Road*	Dual left turn lanes, two through lanes, right turn lane on all approaches.	■	
Marion Road/Eastwood Road	Install traffic signal.	■	
TH 14/ east of 40 th Street	Widen to four-lane section.	■	
40 th Avenue between Eastwood Road and 20 th Street	Construct 40 th Avenue connection between Eastwood Road and 20 th Street.		■
TH 14/40 th Street	Install traffic signal.		■
	Provide dual left turn lanes, a through lane, and a right turn lane on south approach.		■
	Provide left turn lane, through lane, and a right turn lane on north approach.		■
	Improve sight distance on TH 14.		■
Marion Road between 20 th Street and 40 th Avenue	Widen to four-lane divided section.		■
20 th Street between 11 th Avenue (CSAH 1) and Marion Road (CSAH 36)	Conduct study of possible connection before traffic levels at the TH 14/Marion Road intersection reach 85 percent of projections under the 2025 development scenario. The study will be triggered when traffic levels at the TH 14/Marion Road intersection reach 70 percent of projected traffic levels under the 2025 development scenario.		■
Marion Road/20 th Street	Install traffic signal.		■
	Provide separate turn lanes for all movements on all approaches.		■
Marion Road/40 th Avenue**	Provide separate turn lanes for all movements on all approaches.		■

* Existing deficiencies in 2002.

** These enhancements would only be necessary if the proposed 20th Street connection is constructed.

2.10.2 Bike and Pedestrian Travel

The ROCOG travel demand model used to develop the traffic forecasts for this report generates vehicle trips. This means that the trips generated by the model are trips completed by passenger vehicles only. Future pedestrian and bike trips would occur outside of the domain of the forecasting model. Typical rules of thumb state that bike and pedestrian travel make up less than five percent of total vehicle trips made. Because of this, these two modes of travel are not expected to have a direct effect on roadway needs in the project area, but will affect the road right-of-way needs where trails are commonly built. It should be noted however, that bike and pedestrian trail extensions are being planned for the project area. If implemented, these trail extensions would provide an alternative mode of commuter travel as well as act as a recreational amenity. The ROCOG Long-Range Transportation Plan provides detail as to the location of existing bike and pedestrian trails as well as the planned location of future trails.

2.10.3 Transit

Today, two fixed route transit lines serve the AUAR project area. Route 4 Travels between the Parkside Store on Marion Road and downtown Rochester. Route 4 buses travel on Park Lane and Marion Road in the project area as far south as the Parkside Store and then travel north out of the project area on 15th Avenue and 6th Street into downtown. Monday through Friday, route 4 buses operate at half-hour headways during the AM and PM peak periods and at one-hour headways during the midday. Limited service is available on Saturdays. The route serves approximately 340 trips per day on Monday through Friday.

A number of households in the project area were surveyed in 1997 to determine interest in fixed route bus service. The results of the survey indicated a high level of interest in transit service. Based on this survey, Route 17 was established in the project area. Buses on Route 17 travel on TH 14, 50th Avenue (CSAH 11) and Marion Road in the project area. The route operates on Monday through Friday during the AM and PM peak periods. Service is provided at half-hour headways during the AM peak hour and one-hour headways during the PM peak hour. The route serves approximately 80 trips per day.

The City of Rochester tracks performance of its transit routes and decisions regarding the establishment or continuation of service are based on review of fiscal and operating measures and how they compare to established service standards. Decisions to maintain transit service in the study area will be based on the demand for service and whether the service can be provided in a cost-effective manner.

2.11 Cultural Resources

Where areas of recorded archaeological sites, high or moderate potential for intact archaeological sites, or sites with potential historic or architectural significance have been identified, the City will require developers to coordinate with the SHPO regarding the evaluation of potential archaeological, historic, or architectural sites identified in the inventory prior to development. This may include the completion of a Phase 1 Archaeological Survey and/or historic and architectural assessment.

3.0 STEWARDSHIP MITIGATION MEASURES

This section describes mitigation measures to address the needs of this specific project. The City will implement the following stewardship mitigation measures.

1. Educate:
 - a. Decision-makers, the development community, local government staff, and citizens on the benefits of and programs available for natural areas conservation and land stewardship.
 - b. Existing landowners prior to the conception of development plans for their land to inform them about alternative development styles and tools available to conserve the natural resources present on their property.
2. Prepare an Environmental Review Checklist for use by developers to confirm their understanding of the AUAR data, identify the Mitigation Plan measures applicable to their development proposals, and document their developments consistency with the hypothetical development scenario. In lieu of completing an EAW worksheet, the Checklist will outline natural resource features, mitigation measures, and land stewardship options as part of the General Development Plan review process as a means to encourage developers to fit the subdivision to the land rather than make the land fit the subdivision.
3. Provide the development community, consulting firms, governmental units, and referral agencies with examples of conservation design subdivisions and other stewardship tools along with electronic data (e.g., CDs or ArcIMS access on the Internet) that delineates sensitive areas and links AUAR data and mitigation requirements with parcel base maps for use in project design and review.
4. Update the City of Rochester's *Parkland Acquisition Plan* within the next five years to identify future park needs in the AUAR project area including the identification of floodplains and other natural areas appropriate for public land acquisition in consideration of passive use and environmental corridor development.
5. Update the *Rochester Urban Service Area Land Use Plan Map* to delineate cultural (archaeological, historic, and architectural) sites and environmental corridors located in the recently expanded areas of the City's Urban Service and Urban Reserve Areas by the end of 2004.

4.0 CUMULATIVE IMPACTS

The western portion of the project area contains several small lot developments. The easterly edge of the project area consists of large lot development and open areas. The development pattern and character of the project area will become more urban and may affect the quality of life currently valued by many of the current residents. As development occurs much of the existing vacant and/or open area will be lost. The fairly contiguous habitat corridor along Bear Creek and Badger Run may become more fragmented as development occurs. The mitigation measures already identified in this Mitigation Plan will help to control these impacts. However, the change from rural to urban land use will remain notable change.

This Mitigation Plan addresses cumulative impacts related to the implementation of the hypothetical development scenario for the AUAR project area. Table 3-1 presents a summary of mitigation measures that are addressed in this Mitigation Plan. The information contained in this section is based upon existing information, regulations, and requirements that may periodically be amended, modified, or replaced as development occurs in the Marion Road Trunk Sanitary Sewer Project area.

FIGURES

APPENDIX A

**RESOLUTION ADOPTING THE MARION ROAD TRUNK SANITARY SEWER PROJECT
AUAR ORDER FOR REVIEW**

APPENDIX B
TRAFFIC IMPACT ANALYSIS

APPENDIX C

NOISE AND AIR QUALITY ANALYSES

APPENDIX D

AGENCY CORRESPONDENCE

APPENDIX E

RECORDED WELL LOCATIONS

APPENDIX F

**COMPREHENSIVE PLAN CERTIFICATION DOCUMENTATION
PLANNING/EQB MEETING**

APPENDIX G

OLMSTED COUNTY SOIL SURVEY INDEX TO MAP UNITS